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COMPUTERWORLD

IBM, Apple seal promise-laden pact

BY JAMES DALY
CW STAFF

Will last week's IBM/Apple Computer, Inc. alliance result in the "renaissance in technological innovation" that Apple Chairman John Sculley foresees, or will it be a sack of unfulfilled promises? Users who have seen similarly hyped unions fall short of their intended goals are keeping their fingers crossed and hoping the pair can deliver on plans to link the two most popular computing platforms.

As expected, the former rivals signed contracts to form two joint venture companies to create operating systems and desktop multimedia software.

They also unveiled a blueprint for a next-generation Unix system that will merge IBM's AIX Unix, the Apple Macintosh interface and a powerful new microprocessor, as well as plans for a suite of connectivity products that will begin arriving by the end of the year.

Deliverables
Products from the Apple/IBM alliance are expected to be released over a five-year span

- Connectivity tools to integrate Macintoshes into IBM networks. First products due in **December 1991**.
- New family of RISC chips for PCs and workstations. Products due in the **mid-1990s.**
- New open systems environment derived from AIX, the Macintosh and the Power PC architecture. Products due in the **mid-1990s.**
- Kaleida, an independent firm, will create multimedia technologies. First products expected in the **mid-1990s**.
- Taligent, an independent company, will develop an object-oriented operating system. Product due in the **mid-1990s.**

Source: Apple Computer, Inc./IBM
CW Chart: Janell Genovese

If successful, the ambitious joint effort would greatly boost the ability of Macintoshes and IBM Personal Computers to interact and open up the opposing platforms to those who have long cringed at mixing them.

"Where we have dismissed Apple in the past, this could open our eyes," said Joseph Vallorosi, assistant vice president of information systems at Consolidated Edison, an electrical utility in New York. "This brings Apple credibility in the business community."

Users are aware, however, that a long road of highly complex technical work lies ahead. "Immediately, this doesn't mean

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ACEs up

▶The ACE consortium has grown and has better defined its desktop technology. Page 137.

Users griping about slack AIX support

IBM commits to quick service improvements

BY JOHANNA AMBROSIO
CW STAFF

SANTA CLARA, Calif. — Users gathered here last week said there are some holes in IBM's much vaunted technical support, especially for the AIX Unix-based operating system.

The fundamental problem, users said, is that there are too few technically knowledgeable IBM representatives trying to serve too many customers. Some users said they felt that IBM's primary push has been on marketing and selling the RISC System/6000 line, which runs AIX, at the expense of support.

"We've found there to be a great shortage of systems engineers that can help us ramp up," said William Ramsay, senior analyst at Abbott Laboratories in Abbott Park, Ill. "To be fair to IBM, we didn't give them much notice. We told them we were buying 15 RS/6000s, and we needed help, fast."

Ramsay said he has experienced no problems on the hardware side of things, just on the software end. He and other users were here for AIX Expo, an RS/6000 trade show and user group conference.

Another customer at a large Midwestern consumer-goods company said, "Every time I ask

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Tax change could slap buyers with extra software expense

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A U.S. House of Representatives bill that is given a good chance of passing could significantly boost the cost of purchased software while forcing users to carry some software on their books long past its useful life.

The bill would require the purchase value of intangible assets — such as software, databases, customer lists, trademarks and "good will" — to be amortized, or written off, over a period of 14 years. For software buyers who now typically write off software in five years or less, that would defer tax deductions and effectively increase the cost of the software (see chart).

Predictably, both users and software vendors lined up in strong opposition to the Bush administration-supported bill, arguing that software is not really intangible and that tax laws

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Long-term cost
Carrying software costs over a 14-year period could translate into a 21% higher cost than expensing it immediately

Alternative I: Expense immediately	
Cash purchase price	$100,000
Tax deduction (corporate rate 34%)	$34,000
Effective cost	$66,000
Alternative II: Amortize over five years	
Cash purchase price	$100,000
Net present value of tax benefit over five years (discounted at 10%)	$28,000
Effective cost	$72,000
Alternative III: Amortize over 14 years	
Cash purchase price	$100,000
Net present value of tax benefit	$20,000
Effective cost	$80,000

Source: Lotus Development Corp.
CW Chart: Michael Siggins

DEC to extend open network strategy

BY ELISABETH HORWITT
CW STAFF

SAN JOSE, Calif. — Digital Equipment Corp. is expected to contribute to the openness theme of this week's Interop '91 show with several announcements that link its systems with those of other vendors.

DEC plans to announce availability dates for its Open Systems Interconnect-based routers, links between Ultrix and IBM's Systems Network Architecture and Token Ring versions of its Pathworks client/server software, according to a DEC press release draft obtained by *Computerworld*.

The announcements are further proof that DEC and other computer vendors have realized that users will no longer automatically buy the vendors' proprietary networking products to accompany their hardware and software, said Rick Villars, director of Computer Network Architectures at International Data Corp. in Framingham, Mass. The major vendors are choosing to address users' multivendor networking needs themselves rather than see the money go to third parties, he added.

Fall fling

▶DEC's VAX product line is due for an end-of-the-month shake-up. Page 6.

With the expected announcements of DEC Network Integration Server products, DEC will claim to be the first vendor to ship routers supporting the OSI Intermediate System-to-Intermediate System routing standard.

The vendor has tagged a January 1992 shipping date and a

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INSIDE

Product Spotlight — TCP/IP can work for PC LANs — if you're willing to work at it. Page 97.

A crackdown on computer crimes may help to define those crimes. Page 4.

It's transition time for banks — some must look to outsourcing and others have to look at new ways to justify their investments. Pages 8 and 113.

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"This brings Apple credibility in the business community."

JOSEPH VALLOROSI
CONSOLIDATED EDISON

On the Apple/IBM joint venture. See story page 1.

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"NAAAH - HE'S NOT THAT SMART. HE WON'T BACK UP HIS HARD DISK, FORGETS TO CONSISTENTLY NAME HIS FILES AND DROOLS ALL OVER THE KEYBOARD."

EXECUTIVE BRIEFING

■ **While IBM and Apple signed contracts and provided details on their partnership last week,** users expressed hope that this alliance will show more results than some other industry unions have. The firms pledged to do the following: establish joint venture companies to create operating system and desktop multimedia software; develop a new Unix based on IBM's AIX and the Macintosh interface and a new microprocessor for a mid-1990s release; and begin releasing connectivity products. **Page 1.**

■ **Banks have traditionally not been required** to provide a direct link between system implementations and business value. That may be changing: Top IS banking execs, pressured by a faltering economy and bad debt, are looking more closely at downsizing and are scrutinizing measurable areas such as applications development costs, chargeback fees, data center costs and project payback periods. **Pages 8, 113.**

■ **Met Life confronted the threat of several computer viruses** scheduled to trigger on Friday, Sept. 13, and came out virtually unharmed. The company attributes its success to an ongoing computer security awareness program. **Page 89.**

■ **The Micro Managers Association** tells software vendors it wants more liberal licensing policies, particularly for software running on a network. **Page 4.**

■ **A U.S. House of Representatives bill on intangible assets, which includes software,** would require such assets to be written off over the course of 14 years, delaying tax deductions and increasing the overall cost of software. **Page 1.**

■ **IS managers are stoking employees' motivational fires** via job rotation, education programs, frequent performance appraisals and more open lines of communication. **Page 121.**

■ **The U.S. Department of Justice says it will play hardball when it comes to computer crime.** The agency's pending computer crime unit will prosecute such offenses and push for tougher penalties. **Page 4.**

■ **It looks as if Oracle users will have to wait until next year** to get Version 7.0 of its relational database management system, which is intended to support a distributed database environment. **Page 136.**

■ **As users demand laptops and portables** in addition to their desktop systems, managers scramble to set standards. **Page 129.**

■ **European IS managers do not expect budgets to be much bigger next year.** Almost a third of those surveyed said 1992's budget would be the same as this year's, while 10% said they expect a decrease. **Page 89.**

■ **Some IBM RS/6000 users are not satisfied** with the quality of service they've been receiving, but IBM promises it will improve soon. **Page 1.**

■ **Will the TCP/IP market continue to grow?** According to Newton-Evans Research's latest report, no. Hardware and software markets will peak in 1992 and decline from there. What will increase are TCP/IP services, including network administration and central network management. **Page 97.**

■ **On site this week:** The Travelers turns the client/server concept into reality by producing some of its own software for the architecture. **Page 77.** Bell Atlantic launches a $1 billion project to revamp hundreds of applications and move from a mainframe-based architecture to open systems. **Page 29.** The U.S. Department of Justice's Civil Rights Division will use computers for the first time to analyze states' redistricting plans and to ensure that they are fair to minority groups. **Page 65.**

Sorting is critical for efficient, competitive direct marketing operations

To maintain a leading position in the highly competitive direct marketing business requires a dedicated focus on controlling overhead costs while providing enhanced customer services. To achieve these seemingly contradictory objectives, leading direct marketing firms rely on sophisticated data processing systems.

AT&T American Transtech, Jacksonville, Florida, a wholly-owned subsidiary of AT&T and one of the nation's largest direct marketing firms, is a case in point. The company was established in 1983 to act as the stock transfer agent for all AT&T and regional Bell operating companies (RBOCs) after AT&T's divestiture. Since that time, service offerings have been expanded to include shareowner service functions for other companies, financial print and mail, and direct marketing.

From its inception, AT&T American Transtech realized that capturing a lion's share of these markets would require maximizing the efficiency of mailing operations to the point where many of the accrued savings could be passed along to their customers. Only by differentiating their services and fee structure this way could the company establish itself as an industry leader.

For example, by implementing Group 1 software (Green Belt, Maryland) and SyncSort OS (from Syncsort Inc., Woodcliff Lake, New Jersey), AT&T American Transtech has saved more than $1.2 million in postage costs during the last six months for its customers. Additionally, the same process enables the company to cost-effectively pre-process and pre-sort customer data—steps that other direct marketing firms require from the customer before they will even accept mailing data.

"By sorting mailings according to various post office requirements, postage costs can be reduced about 20 percent," explains Ralph Martin, Programmer Analyst at Transtech. "However, since postage costs are passed along to the customer, most direct marketing companies do not bother to perform the requisite sorts. Or, if they do complete the sorting, it is done in such a way as to incur a large overhead cost that is also passed along to the customer."

"Our approach," he continues, "is different. By streamlining sorting and mailing operations with a sorting process that minimizes both programming and processing overhead, we are able to pass along the full postage savings to our customers."

The sorting software utilized by Transtech interfaces directly with their mailing system to provide an integrated solution. Files containing names and addresses of individuals to receive a mailing are first sorted by zip code, and, if required, a grouping code. Grouping codes provide a secondary sorting criterion, such as mailing date or mailing contents.

Ralph Martin, left, Programmer Analyst, and Bob Shahbazi, Statistical Analyst of AT&T American Transtech, Jacksonsville, FL

"These sorted data files," explains Bob Shahbazi, Statistical Analyst at Transtech, "are then passed to the mailing system which generates zip code statistics. We then use the Group 1 and SyncSort software to sequence these statistics and merge them with the sorted names and addresses to determine the appropriate trays and bundles for each letter."

Additional sort codes may also be attached to the tray numbers. "For example," Shahbazi says, "we mail over eight million dividend checks every quarter for AT&T and the 7 regional holding companies which have to be delivered all over the country on the first day of various months. In order to ensure timely delivery, mailing dates need to be based on destination location; mail going to Los Angeles is sent via truck, for instance, so it has to be sent earlier than mail to Hawaii which goes via airplane. Such scheduling is easily accomplished by using our sorting software to rank the zip statistics on the basis of mail time."

Transtech's sorting software is also used for separating customer data for multiple mailings. "Sometimes customers send us a single tape of data containing coded names and addresses which are to receive different inserts in their mailings," Martin explains. "We save our customers the hassles of pre-sorting data by incorporating this category sort as an integral part of our global zip code sorting process."

1-800-535-3355

syncsort

50 Tice Boulevard
Woodcliff Lake, NJ 07675

"With our sorting software, we're able to set up a multiple-tiered sort and the coding required for generating the rather complicated report detailing counts for all categories in about 30 minutes," he continues. "Without SyncSort the set-up process might take more than one day to write, test, and debug a COBOL program. Our method results in lower data processing costs for Transtech and its customers."

Transtech also uses their sorting software to modify record formats to their standards, enabling their customers to submit data in any format they find convenient. "A customer may submit data with the three address fields scattered over the record," Shahbazi says. "Where other shops may either refuse to accept such data, or take several hours to write COBOL programs to reformat the records, we modify record layout to meet our standards in a sorting process that takes about 10 minutes to set up—and runs with significantly less overhead than a COBOL program."

Operating overhead is also reduced by using a SyncSort E15 sort exit to modify endorsement lines which appear on envelopes to indicate, for example, if a mailing is presorted. "Some direct mail operations," Martin says, "would begin the modification process by sorting the data, then running a separate application program to modify the line. With this approach another program is required for printing the modified lines."

"What we do instead," he continues, "is modify the record in one pass during the sorting process, thereby eliminating the need for separate COBOL programs and slashing run time for the process."

According to Shahbazi, SyncSort has streamlined operations to the point where he can accomplish in as little as four hours what it would take a COBOL programmer 40 hours to complete. "Besides significantly reducing labor and overhead," he says, "efficient sorting also reduces time spent on tape mounts, and cuts I/O so programs execute faster. I have personally run routines in half the time the same operation would have taken with a COBOL program. Savings with SyncSort are so great, the product pays for its annual licensing fee in the first few weeks of every year."

For AT&T American Transtech, the real benefit of such sizably decreased overhead costs is the ability to offer the highest quality service at the lowest possible price. "By maximizing utilization of our data sorting software, we have been able to respond to our customers' needs for sophisticated data processing services at prices we both can afford," Martin says.

Justice revs up battle on computer crime

BY MICHAEL ALEXANDER
CW STAFF

WASHINGTON, D.C. — The nation's top federal computer crime law enforcers announced plans last week to escalate the war on computer crime.

At the federal government's 14th National Computer Security Conference held here, officials at the U.S. Department of Justice said the department is launching a computer crime unit that will be charged with prosecuting crimes and pushing for stiffer penalties for convicted computer outlaws.

"Computer crime is on the rise, and the Justice Department is taking this area very seriously — as well as the FBI, U.S. Secret Service and the military," said Mary Spearing, chief of general litigation and legal advice in the criminal division at the Justice Department.

The new crime unit will also advocate closing loopholes in the government's computer crime statute. The Computer Fraud and Abuse Act of 1986 "is outmoded and outdated," said Scott Charney, a computer crime prosecutor and chief of the new computer crime unit.

The Justice Department wants to amend the law with a provision that would make inserting a virus or worm into a computer system a crime, Charney said.

Law enforcers also want to add a provision that would make it a felony to use a computer system without authorization and to cause damage through reckless behavior. The current law stipulates that the intent to cause damage must be deliberate.

Those convicted of computer crimes will more often be sentenced according to federal guidelines rather than on recommendation of prosecutors, who may ask for lighter penalties, said Mark Rasch, the government's attorney who prosecuted Robert Morris in the infamous Internet worm case.

A new Justice Department policy now mandates that all defendants will be treated equally, without regard for personal history or other factors that might mitigate stiffer sentences, Rasch said.

"The penalties for computer crime will become increasingly more severe," predicted Kent Alexander, assistant U.S. attorney in Atlanta. "In five years, they are going to look back and think [a year in jail] was a light sentence."

The FBI is "staffing up to address concerns about computer crimes" and increasing its training efforts, said Mike Gibbons, FBI supervisory special agent.

White paper urges more liberal software licenses

BY CAROL HILDEBRAND
CW STAFF

NEW YORK — Personal computer managers last week sent a loud, clear message to the vendor community: More liberal software licensing is the direction of the future, and those refusing to comply do so at their own risk.

"It's pretty simple — if you don't like the licensing, don't buy the software," said Jeffrey Knepper, director of tax technology at Deloitte & Touche. "It will have an effect on the company's sales."

The Micro Managers Association presented a white paper on network licensing software at the group's annual conference here. According to D. Keith Herron, co-chairman of the committee presenting the paper, the variety of software licensing agreements available makes it difficult for a manager to control and keep track of what type of software is under what type of agreement. Software can be licensed per machine, per user or per server and on a concurrent-use basis as well as by site/entity. Often, a manager can have one of each type of licensing agreement in the office, making it difficult to keep users educated.

The increasing use of local-area networks also makes administering the various licensing schemes a logistical nightmare. The committee forwarded the following recommendations to help establish a consensus between factions:

- Application software on a network should be available for licensing on a concurrent-use basis. In a concurrent-use license, a company licenses a certain number of software copies and puts them on the network. Metering software prevents users in excess of the preset number from accessing the software.
- Metering software is a necessity for concurrent licensing. The metering package should be integrated with the network operating system with a standard application programming interface.
- Licensing agreements need to be written in more standard language that is clearly understandable to both parties.
- Documentation should be separated from licenses.
- Organizations should be able to upgrade from stand-alone software to networked versions for a price comparable to that of a major upgrade.
- PC managers must educate their users on licensing issues and software piracy as well as establish a standard policy.

Users interviewed at the conference voiced nearly unanimous support for concurrent licensing, a scheme that is gaining support among vendors but which some holdouts, such as Wordperfect Corp., refuse to sanction.

Licensing decisions

Managers favor those software licenses that are easy to administer

Licensed per site	45%
Licensed per concurrent use	31%
Licensed per file server	22%
Licensed per machine	1%
Licensed per individual	0%
Other	1%

Percent of respondents; survey base: 137

Source: Micro Managers Association

Although the concurrent licensing idea received support from such vendors as Microsoft Corp. and Symantec Corp., they were not as optimistic on other points. For example, Microsoft said it has no plans to offer site licenses, another popular option. And both vendors nixed the idea of adding metering software into network operating systems, opting for endorsement of third-party efforts.

Beth Haskell, a computer coordinator at The Trust for Public Land, agreed that concurrent licensing is something that works and also expressed interest in so-called 80/20 licensing, in which a user who runs an application on his desktop about 80% of the time is free to use that software on the road or at home the remaining 20%.

CA DBMSs to run Wang imaging systems

BY SALLY CUSACK
CW STAFF

NEW YORK — The metamorphosis of Wang Laboratories, Inc. continued last week when the company signed a deal to provide software giant Computer Associates International, Inc. with Wang imaging systems that would run in conjunction with CA's mainframe-based database management packages.

On a royalty basis, CA will add Wang imaging capabilities to the CA-IDMS and CA-Datacom/DB database products and to the CA-ADS and CA-Ideal applications development environments.

CA's niche market of database users has decided not to migrate to IBM's DB2 and, subsequently, does not have access to IBM's Imageplus software.

This creates a market opportunity for Wang's imaging products on the mainframe, said Ajit Kapoor, director for image management strategies at Meta Group, Inc. in Westport, Conn.

While cash terms of the contract were not disclosed, William P. Ferry, senior vice president and general manager for Office 2000 Systems at Wang, said this is a multiyear agreement with an initial period of three years.

CA plans to have the image-enabled software products, its first, delivered by the first quarter of 1992. Wang will provide CA customers with image server and desktop hardware and software designed to integrate tightly with the CA applications. The company will also offer image consulting services.

Wang will continue to market its imaging products on its VS minicomputer platform and will continue to seek opportunities with other vendors.

Last week's alliance will allow CA customers to reap the productivity gains of imaging without expensive database upgrades on the mainframe, said Kurt Seibert, CA's vice president of strategic alliances.

However, Kapoor is not optimistic about long-term success.

"The bottom line is that the mainframe is not going to be a strategic platform for image processing," he said, pointing out that imaging is increasingly being offered in a client/server architecture.

Wang and IBM partnered earlier this year with an initial $25 million agreement whereby Wang VS minicomputer users would be provided with a conversion path to the IBM Application System/400 platform. Wang will also resell IBM's RISC System/6000 and Personal System/2 computers.

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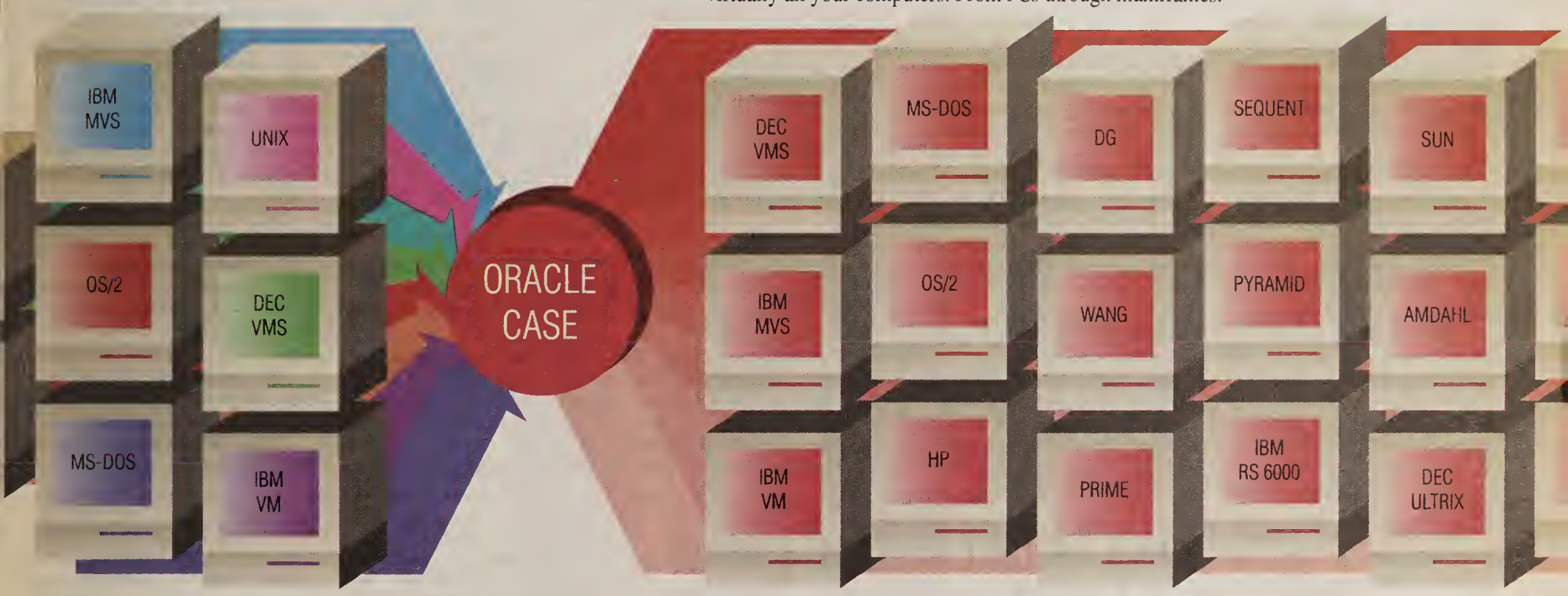

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Interop '91 blends LANs and WANs

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — The ever-shifting bottleneck in communications networks is approaching the corporate backbone, and equipment and services on-line at this week's Interop '91 show here are attempting to unblock the clogs.

Public and private wide-area technologies are emerging to keep pace with today's highest speed local-area network, the 100M bit/sec. Fiber Distributed Data Interface (FDDI) LAN. Users will encounter scores of local- and wide-area network product suppliers and carriers hooking equipment together to accommodate such speeds and to allow users to manage enterprise networks cohesively.

"What you'll see in spades is driven by FDDI," said Charlie Robbins, director of communications research at Aberdeen Group, a Boston-based consulting firm. "The bottom line is that users want an integrated strategy for efficiently tying LANs to WAN resources."

For example, several once-wide-area-only vendors will be spreading their wings to merge WAN and LAN networking and to manage enterprises with Simple Network Management Protocol (SNMP)-based systems. Such vendors include Timeplex, Inc., Network Equipment Technologies, Inc. and General Datacomm, Inc.

Dan Lynch, president of show sponsor Interop, Inc., added that this year marks unprecedented participation by public carriers. For example, he said, one regional Bell operating company (RBOC) is flying in 18 executives from a potential customer site for its demonstration of Switched Multimegabit Data Service (SMDS), a 45M bit/sec. public service that will be tariffed in some regions by 1992.

"I'm real interested in SMDS because we're headed for high-speed campus networks" and because of the service's switched nature, said Dan McCormick, manager of networking and integration at GTE Federal Systems Division in Chantilly, Va.

McCormick said he is also interested in the emerging High-Speed Serial Interface (HSSI), a de facto industry-standard electrical interface supporting data transfer rates of T3 (45M bit/sec.) and higher. T3 connections among multiple LANs via HSSI will be demonstrated by router vendor Cisco Systems, Inc.

Cisco will also participate in an integrated frame-relay/Basic Rate Interface Integrated Services Digital Network (ISDN) demonstration at switch maker Northern Telecom, Inc.'s booth. ISDN service is expected from most RBOCs by the end of 1992.

"We'll demo a direct link between an ISDN desktop and a frame-relay backbone through our DMS-100 central office switch without . . . modem pools or multiplexers," said Steve Cunningham, a director of market development at Northern Telecom. "This is significant for small corporate locations not on a LAN that must connect to the corporate backbone. ISDN will give those sites dial-up access to the corporate frame-relay network."

Attendance at Interop is expected to soar from last year's 22,000 to at least 30,000, including 1,000 international attendees this year.

DEC network

FROM PAGE 1

$14,000-to-$40,000 price range to the products, which were announced in June. The products will consolidate multiprotocol routing, bridging and X.25 packet switching inside one box.

However, DEC said in June that the first release would route Decnet, Transmission Control Protocol/Internet Protocol (TCP/IP) and OSI protocols only, with no mention of local-area network-layer protocols.

"The key for us is how soon [Novell, Inc.] IPX routing will happen and that it is Novell-certified," said Bruce Almich, technical manager of data communications at the U.S. Environmental Protection Agency's data center in Research Triangle Park, N.C.

The EPA is a 9,000-node Netware shop that also runs TCP/IP, Decnet and X.25 traffic.

IPX support

IBM, soon expected to announce availability of its own RISC System/6000-based multiprotocol router, has not excluded IPX support in its first release, which would give the firm an edge, according to Almich.

DEC will announce immediate availability of the 802.5 Token Ring products from Proteon, Inc. under the reselling agreement it announced last summer.

The company is also expected to provide Pathworks software to connect Microsoft Corp. DOS and OS/2 clients and servers over Token Ring LANs.

While extending Pathworks' client/server environment to Token Ring should help DEC sell itself as a full-source network vendor, few customers will have use for such an offering, said Keith Addison, a network analyst at G. D. Searle & Co.

Searle, a combination IBM/DEC shop, runs Netware on its Token Ring personal computer LANs, with users accessing VAX printer services via Netware software and Proteon routers, Addison said.

DEC is also expected to expand its IBM Interconnect Program to the Ultrix and TCP/IP environments by announcing a series of products that connect Ultrix systems on Decnet and TCP/IP to IBM SNA systems.

The new Ultrix/SNA products are said to support the same range of services as DEC's existing gateways for VMS with additional support for TCP/IP-to-SNA communications. All products are scheduled to ship by February 1992.

The new Ultrix services should bolster DEC's openness credibility because "It's been a challenge for DEC to talk openness and say it is pushing Unix and not provide the same services they provide over Decnet for VMS," Villars said.

DEC is also announcing Version 1.1 of its Simple Network Management Protocol (SNMP)-based Decmcc Management Station for Ultrix, with support for additional Decnet products, including the new routers, LAN bridges, Fiber Distributed Data Interface concentrators, Decbridge and Decserver Terminal Server products.

The new version is also expected to support the SNMP Remote Network Monitoring protocol, which supports communications between central network management stations and LAN monitoring as well as diagnostic devices [CW, Sept. 30].

By allowing its proprietary network devices to be managed from the same SNMP station as other vendors' devices, DEC is differentiating itself from IBM, which plans to keep SNMP-based network management separate from the system that manages its own Token Ring LANs.

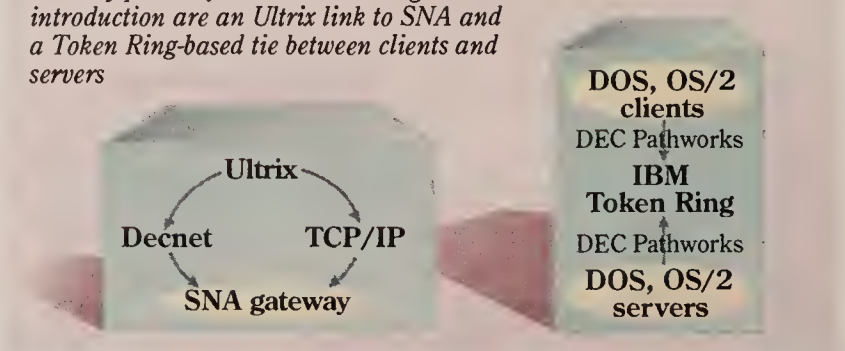
DEC is also expected to announce plans to provide SNMP management support for the Decserver 300 Terminal Server V2.1, as well as its workgroup family of networking products.

DEC would not comment on these expected announcements when contacted last week.

Senior Writer Joanie Wexler contributed to this report.

Piecing it together

Two key points of DEC's networking introduction are an Ultrix link to SNA and a Token Ring-based tie between clients and servers



CW Chart: Janell Genovese

DEC's fall rollout plans include beefed-up VAXs

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — On Oct. 30, Digital Equipment Corp. will hold its annual fall fling of new products in a massive rollout that will likely include souped-up VAX hardware, revamped licensing practices, repackaged applications software and the next version of the VMS operating system.

Users and industry analysts familiar with DEC's plans said they expect the following to be announced:

- New models of VAX 6000s, VAX 4000s, Vaxstation workstations and an additional Microvax 3100 — all with performance at least double that of preceding models and aggressively priced to compete with IBM and Hewlett-Packard Co.
- A repackaging of current Network Application Support (NAS) products to make them easier to sell, install and integrate. Also anticipated is the first clear statement on how and when DEC will license NAS applications for other hardware platforms.
- A menu presentation of the next operating system version, VMS 5.5, with pieces of it unbundled so users can buy VMS stripped down or choose certain functions a la carte. Also expected are features such as universal timing and naming services to ease network management.
- First pieces of "Open VMS" with Posix modules available, giving users the chance to experiment with moving code from Unix environments to VMS.
- Changes in the software licensing scheme, with user-based or "activity-based" licenses available to correct past inequities from pricing by size of CPU.

Some analysts questioned how effectively DEC can push new VAXs now, however. Within the next year, the new generation of reduced instruction set computing-based Alpha VAXs is slated to start appearing.

"The Alpha family is going to be the midrange technology of the future," said Robert Forster, supervisor of DEC systems for the information management department at Sikorsky Aircraft in Stratford, Conn. "Buying VAXs now is buying into the end of the architecture. Why not lease now and buy Alpha later?"

DEC is already briefing certain key customers on the details of its Alpha systems, several users confirmed. Yet some users said DEC is making the right move by pushing its best current technology. "They're not really going to just drop the VAX line," said Paul Stieman, associate vice president for computing at the University of Pittsburgh.

The lower priced hardware may mean a change in buying plans for some customers. With an entry-level, diskless Vaxstation priced as low as $3,500, sites such as the Lawrence Livermore National Laboratory in Livermore, Calif., are already planning to buy more Vaxstations instead of additional Unix-based machines.

The unbundling of VMS should be welcome at smaller companies needing only a few basic features, but users at larger VAX/VMS sites may face more difficulty in systems administration and management.

In moving to repackage its NAS software products, DEC is signaling a strategic shift in its thinking about how to sell DEC software on other vendors' platforms, analysts said. NAS is a broad set of programming interfaces, tool kits and integration software that includes products such as Decwindows and Pathworks for DOS.

"DEC wants to be in the software business, and the only way to be profitable is to sell on other platforms and increase market share," said Hal Kolp, information systems operations manager at National Semiconductor Corp. in South Portland, Maine.

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NEWS SHORTS

Industry leader Biddle dies

A. G. W. "Jack" Biddle, 60, founder and president of the Computer & Communications Industry Association (CCIA), died Oct. 1 of cancer. He was a persuasive advocate of full and open competition, and he created CCIA in 1972 to promote the use of "better, cheaper and faster" as criteria for success in the industry. In the mid-1980s, he led the formation of the Corporation for Open Systems, a global joint venture to promote interoperability of computer and communications equipment.

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Boeing scores Army deal

Boeing Computer Services last week beat out Computer Sciences Corp. for a $1.6 billion, 11-year systems contract from the U.S. Army. Boeing will set up an integrated information system to support 9,800 Army National Guard and Army Reserve units at 4,700 locations, replacing a variety of unrelated hardware and software. The system will reportedly support rapid mobilization of forces and serve routine administrative functions. Boeing will install hardware from Digital Equipment Corp., Zenith Data Systems, Hewlett-Packard Co. and others.

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New Objectvision near readiness

Borland International, Inc. said it will ship Release 2.0 of its Objectvision applications development tool next month, adding that it is developing a separate version for IBM's OS/2 2.0 operating system. Borland also said it is developing a SQL link option for Objectvision 2.0 that will support access to data on SQL Server, Sybase and DB2. Both the OS/2 2.0 version and the SQL link are slated for a first-quarter 1992 ship date.

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IBM closes Metaphor deal

Metaphor Computer Systems, Inc. shareholders have approved the company's purchase by IBM. As a wholly owned subsidiary of IBM, Metaphor will focus on fully integrating Metaphor's Data Interpretation Systems capabilities with complementary IBM capabilities. Metaphor employees who were assigned to Patriot Partners' joint venture established by IBM and Metaphor in September 1989 will be offered opportunities with either of two new ventures announced last week by IBM and Apple Computer, Inc.

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New RISC models from IBM

IBM last week added a new deskside model to its RISC System/6000 Unix-based line, the Powerstation/Powerserver 530H, offering 32% more processing power than the Model 530 at no increase in price. It is available immediately, priced at $31,500 for a base system with 32M bytes of memory and 400M bytes of disk. In a separate release, IBM announced three fault-tolerant reduced instruction set computing System/88 machines, which are relabeled Stratus Computer, Inc. systems. The System/88s, however, are priced about 30% higher than the identical Stratus systems.

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Token Ring links VAX to mainframe

Systems Strategies, Inc. announced last week what is said to be the first product to support communications between Digital Equipment Corp. VAXs and IBM mainframes directly over a Token Ring network. Through the firm's EZbridge software, VAXs equipped with Token Ring boards can talk to IBM hosts without a gateway, the vendor said. Availability is slated for year's end, with prices ranging from $3,000 to $15,000.

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Bank outsources systems

The Chase Manhattan Bank of Connecticut, a subsidiary of The Chase Manhattan Bank NA, said it will turn over part of its information systems operations to IBM's outsourcing unit, Integrated Systems Solutions Corp. (ISSC). ISSC will hire approximately 30 of the 38 IS workers involved in that section of Chase's computer operations, a source at Chase said. He would not clarify which operations will be outsourced but confirmed that the bank expects to save 30% on IS-related expenses.

More news shorts on page 136

Study: Outsourcing big in banks' future

BY MITCH BETTS
CW STAFF

The flurry of mergers and outsourcing deals in the banking industry this year will turn into a blizzard during the next decade, according to a major new study of the future of U.S. banking.

The Vision 2000 study, released last week by Arthur Andersen & Co. and the Bank Administration Institute, predicted that the consolidation will cut the number of U.S. banks by 25% and could eliminate about 250,000 jobs.

Meanwhile, banks will give top priority to cutting costs, reengineering work flows and outsourcing back-room operations, the study said. Information systems will see the greatest amount of outsourcing.

M. Arthur Gillis, president of Computer Based Solutions, Inc., a New Orleans-based IS consultancy specializing in the banking industry, agreed with the study's conclusions but said the outsourcing trend should not be overstated: "It's a consistent trend but not a growing trend."

The industry's basic problem of overcapacity — too little revenue supporting costs that are too high — will be fixed by mergers and cost reductions from automating and streamlining operations, according to Waino H. Pihl, head of the banking practice at Andersen Consulting in Chicago and a study leader.

"Consolidation and powerful information systems will provide the impetus for back offices to become much more centralized and automated, creating the potential for dramatic, rather than incremental, gains in productivity," he explained.

Midsize and small banks reported that data processing operations will be high on the hit list for cost-cutting efforts (see chart), which helps explain the trend toward outsourcing.

However, even banks once considered too large to use service bureaus have begun to look into IS outsourcing, said Richard M. Sullivan, executive director of the Bank Outsourcing Alliance in Melrose, Mass. Outsourcing may even be a way to stave off a merger, Sullivan said. With outsourcing, "you're gaining many of the benefits of a merger — achieving economies of scale — without merging, without losing your identity."

The Bank Outsourcing Alliance, now in its formative stage, will be a forum where banks can evaluate the benefits and dangers of outsourcing, Sullivan said. The annual fee is $15,000.

The Vision 2000 study also hinted at how strategic IS could give banks a competitive advantage: true differentiation on price and quality.

"Consumers know the difference between Wal-Mart and Macy's," Pihl said, "but few retail banking customers can find any difference between the Top 2 local banks in their communities." He said banks need to "break away from the pack" through specialization.

Hit list

Information systems is one of the areas bank executives cited as being a high or moderate priority for cost cutting

	Bank size		
	Assets over $5B	$500M to $5B	Under $500M
	Priority	Priority	Priority
Branch operations	High	High	High
Data processing	Moderate	High	High
Administration	Moderate	Moderate	High

1991 survey of 250 bank executives and experts

Source: Arthur Andersen & Co./Bank Administration Institute — CW Chart: Janell Genovese

Slack AIX

FROM PAGE 1

a question, I'm surrounded by IBMers who don't know the answer. They have to call other people, including subcontractors, before I can get any help."

Roy Schulte, an analyst at Gartner Group, Inc. in Stamford, Conn., said, "AIX support is not up to IBM's general standards for technical support. It's catch-as-catch-can."

William J. Filip, president of IBM's Advanced Workstation Division, said IBM is taking steps to fix the problem. "I appreciate that there are many situations where you don't have all the skills you'd like. Hopefully, this will get better at a rapid pace," he told conference attendees.

Filip said that because of the rapid acceptance of the RS/6000 IBM has been running to keep up with demand. IBM is providing technical training to employees; more than 30,000 "student days" of classes were given last year, he said. This year, "we're spending twice as much time on it [as would be justified by] the money we're making on it."

Separately, Filip talked about the low-end RS/6000 that was delayed because of I/O chip problems. The low-end machine will be sold at under $10,000 retail. It will likely be announced during the first quarter of 1992 and will ship in volume later in the year. He said it will have half to two-thirds the performance of an RS/6000 Model 320H at half to two-thirds the price.

Filip also said that the personal workstation is "not a replacement for the 320H" and that the 320H line would continue to be sold and supported.

Filip denied rumors that the small RS/6000 was delayed because of marketing considerations that it would cut into sales of existing models, especially in Europe. He did acknowledge, however, that there would be overlap between the RS/6000 line and other IBM product families, especially the Personal System/2 personal computers and the Application System/400 midrange. But, he said, "we're less concerned about overlap than we are about having gaps in the product line."

He and other IBM executives shared the following, yet-to-be-announced plans for AIX and the RS/6000 line:

- The low-end RS/6000 workstations will come in two announcements. The first will be a little larger than a high-end PS/2; the second will be more comparable to an I486 PS/2.
- The AIX operating system will be downsized in two steps to keep up with the hardware. The first version of AIX-lite will be announced later this year.
- Multiprocessing versions of the RS/6000 and AIX will be announced probably late next year and delivered in 1993. They will support loosely coupled multiprocessing first, with tightly coupled support coming later.
- A database management system for the RS/6000 family that would be based on Version 2.0 of the OS/2 Extended Edition database manager. The AIX version will be out next year.
- RS/6000-based technology will show up in other IBM product lines, including on the AS/400 and PS/2 and as back-end and front-end processors for the 3090 family. Plans do not call for melding the RS/6000 and AS/400 processors into one box.

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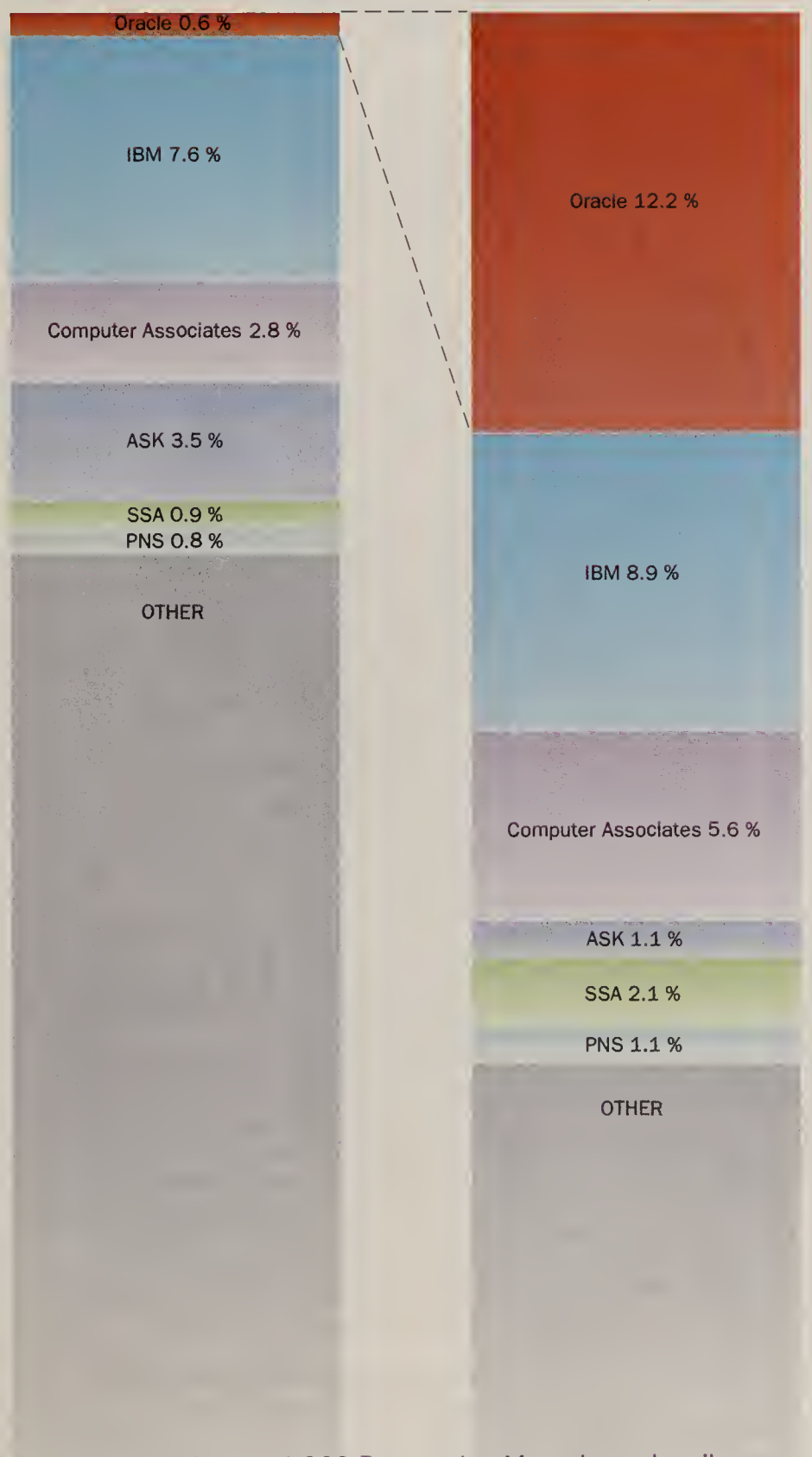

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Lotus, Borland duke it out in copyright suit

BY ROSEMARY HAMILTON
CW STAFF

BOSTON — A routine legal step in the Lotus Development Corp. lawsuit against Borland International, Inc. turned into controversy last week when two independent parties filed briefs on copyright law with the U.S. District Court here.

The friend of the court briefs, one of which was filed by the U.S. Department of Justice on behalf of the U.S. Copyright Office and another by a group of 10 law professors, are neutral documents intended to assist the court in understanding copyright law, both parties claim. However, Lotus and Borland ended up in a verbal battle over the significance of the filings.

Lotus filed suit against Borland in 1990, claiming its Quattro Pro spreadsheet software infringed on the copyright Lotus holds for its 1-2-3 software. Lotus had previously emerged the victor in three copyright infringement lawsuits, including one against Paperback Software International, Inc.

Last week's briefs were filed as Borland submitted its response to an earlier Lotus motion asking the court to resolve the lawsuit without a trial. Borland answered by claiming that Quattro Pro does not infringe on Lotus' copyright. It also filed its own motion for summary judgment, which now means both parties agree that the case can be resolved without a trial.

Borland then maintained that the third-party briefs will bolster its case, while Lotus accused Borland of misrepresenting the legal documents.

Meanwhile, one independent observer said this controversy is likely pointless.

"The judge is not bound in any way whatsoever by friend of the court briefs," said Les Gesmer, a partner at Lucash, Gesmer & Updegrove, a Boston law firm specializing in computer law. Gesmer said the Justice Department brief is a generic summary of copyright law and is "so neutral as to be meaningless."

The second brief was filed by 10 law professors and has more bite to it. The professors took issue with U.S. District Judge Robert Keeton's decision against Paperback.

"These are 10 leading copyright professors, and they are asserting their opinion as to how the court ought to use traditional tenets of copyright law in the Lotus/Borland case," said Spencer Leyton, Borland's senior vice president of business development.

The professors claim the Paperback case shows that the court's interpretation of what can be protected by copyright law is too expansive.

Lotus downplayed this brief. The company said some of the professors had expressed these same opinions during the Paperback lawsuit, and those opinions were rejected by the court.

"It may be 'user-friendly' to you Fraser, but it sure hasn't taken a liking to anybody else."

Software tax

CONTINUED FROM PAGE 1

governing its treatment are well-established.

They also argued that the bill would slow the advancement of technology in the U.S. by inhibiting users from upgrading systems. We are "convinced the 14-year amortization period will place purchasers of software at a competitive disadvantage relative to international purchasers," said Charles Shewbridge III, assistant vice president for taxes at Bellsouth Corp. Most foreign companies use a three- to five-year write-off schedule, he said.

Shewbridge said advances in communications technology require carriers to install new network software as often as every two years, so a 14-year schedule would leave useless software on balance sheets for more than a decade.

"Software is not really intangible; it does work," said Hank Willen, director of corporate information systems at Becton, Dickinson & Co. "And 14 years does not represent the real world. The useful life of most of our software is in the neighborhood of five years."

The bill would apply the 14-year write-off only to software purchased externally — either off-the-shelf, developed on a custom basis by a contractor or purchased with a corporate acquisition. Software developed internally or bundled with a hardware purchase would remain subject to current tax rules. Opponents said that is disadvantageous to small firms, which are more likely to buy than manufacture, and contractors, who would see added competition from in-house development.

A congressional source said the bill is likely to win House approval but may not come to a vote this year. He said Rep. Dan Rostenkowski (D-Ill.), the bill's sponsor and chair of the Ways and Means Committee, would prefer to introduce the bill in 1992, an election year, with a popular "engine" attached, such as tax relief for middle-income Americans. He said the final bill would probably exempt packaged PC software from the slow write-off.

While the Bush administration opposes having different write-off schedules for different assets, Assistant Treasury Secretary Kenneth W. Gideon conceded that the tax revision should not apply to commercial nonlicensed software such as word processing packages.

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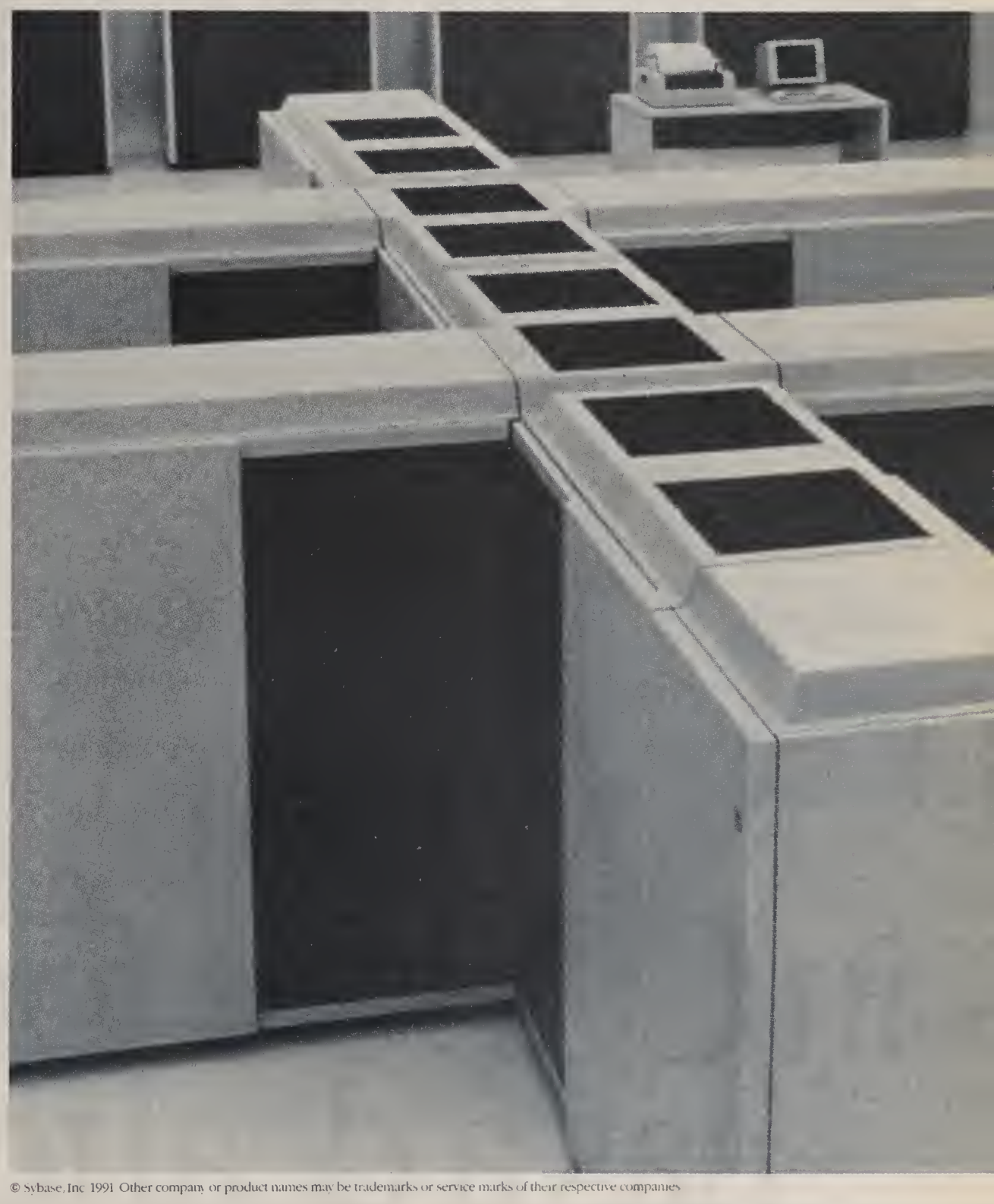

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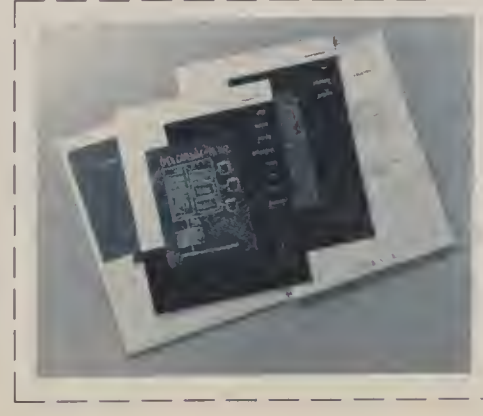

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Microprocessor market heats up with new chips

BY JIM NASH
CW STAFF

Chips and Technologies, Inc. ran out a line of seven new processors for viewing last week. Among them were four 80386-compatible chips. Collectively called Super386, the semiconductors are Chips and Technologies' first foray into the microprocessor market dominated by Intel Corp. and Advanced Micro Devices, Inc.

The San Jose, Calif.-based company also announced shipping dates for a pair of math coprocessors and a palmtop-based chip called the PC/Chip.

Tom Thornhill, an analyst at Montgomery Securities in San Francisco, said Chips and Technologies' 38605SX and 38605DX chips are significant because they have a 512K-byte memory cache that helps boost their performance. Chips and Technologies claims performance increases of up to 40% over similar Intel chips.

However, adding the cache makes the machines incompatible with existing sockets used by personal computer makers designing boxes around traditional Intel and Intel-compatible CPUs, Thornhill said.

Plans at work

For Milpitas, Calif.-based PC maker Twinhead Corp., at least the new socket is not a serious detriment to purchasing the microprocessors, a spokesman said. He explained that the company is already planning to display a PC running on the faster Chips and Technologies chips. There are no plans to use them in production yet, he said.

The 38600SX and 38600DX are pin-compatible with Intel chips. The company said they offer a 10% performance increase over comparable devices.

Both sets of SX chips will come in 16-, 20- and 25-MHz varieties and are scheduled to ship during the second calendar quarter of 1992. The DX chips are expected to ship during the first quarter and will have clock speeds of 20, 25, 33 and 40 MHz.

First pen-based laptop to show

BY JAMES DALY
CW STAFF

MOUNTAIN VIEW, Calif. — Momenta Corp. said it would enter the burgeoning pen-based personal computer market today with a decidedly different beast: a lightweight laptop that integrates handwriting recognition capabilities with the functions of a traditional portable machine.

Analysts said the dual functionality of the 6-pound "pentop" computer could popularize pen-based systems far more readily than current tablet-only models from Grid Systems Corp. and NCR Corp.

"The pentop machine will change the way people think about mobile computers," said Bill Lempesis, publisher of the Pleasanton, Calif.-based "Penvision News." Lempesis predicted that worldwide sales of pentops will reach 8.1 million units by 1995, surpassing sales of laptops and notebooks.

Momenta is the first of what is expected to be a group of vendors releasing pentops. Using a proprietary operating system will allow the firm to begin shipping in volume by next month rather than waiting for the arrival of Microsoft Corp.'s Windows for Pen Computing or Go Corp.'s Penpoint operating systems.

Momenta's 'pentop' *can be used with either an electronic stylus or a traditional keyboard*

Momenta also recognizes both DOS and Windows-based software and will work with Windows for Pen when it arrives later this year, Momenta President Kamran Elahian said.

Momenta can function either as a pen computer that uses an electronic stylus to write directly on the flat-panel screen or as a traditional laptop computer that uses an attachable keyboard.

"People have always had to shape their work around the requirements of the computer, but we decided to build a machine that conforms to the needs of the person," Elahian said.

The machine offsets the need for a mouse through the use of the on-screen Command Compass. To alter a block of text or a graphic, a user touches the pen to the screen to produce the circular compass. Commands are entered when users stroke the pen in specified directions.

The $4,995 machine is based on Intel Corp.'s 20-MHz 80386SX chip and includes a spreadsheet from Penware, Inc. in San Jose, Calif., as well as a word processor and presentation graphics program from Momenta. It also includes a built-in fax and data modem.

The pentop is equipped with 4M bytes of random-access memory and a 40M-byte hard disk.

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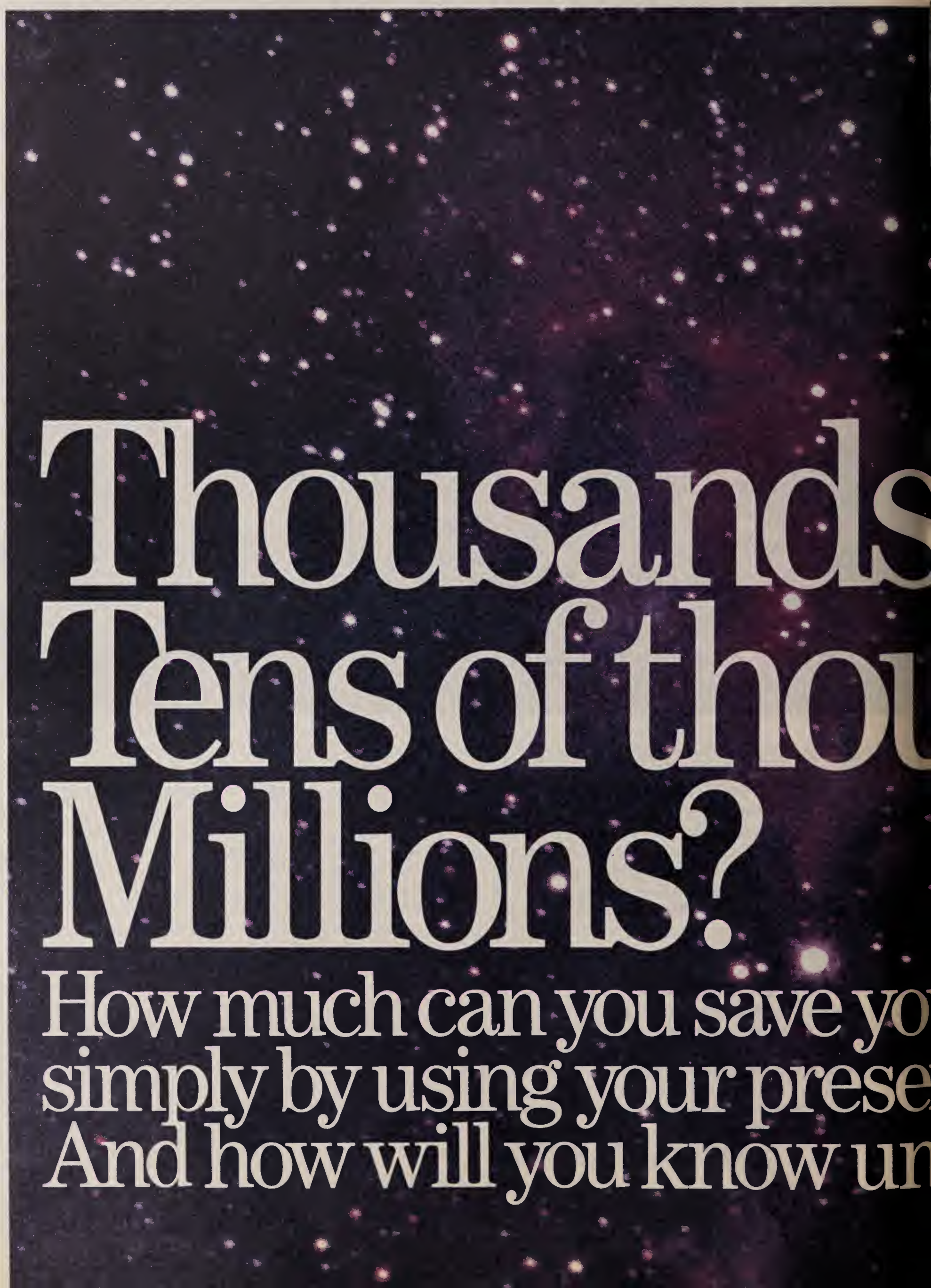
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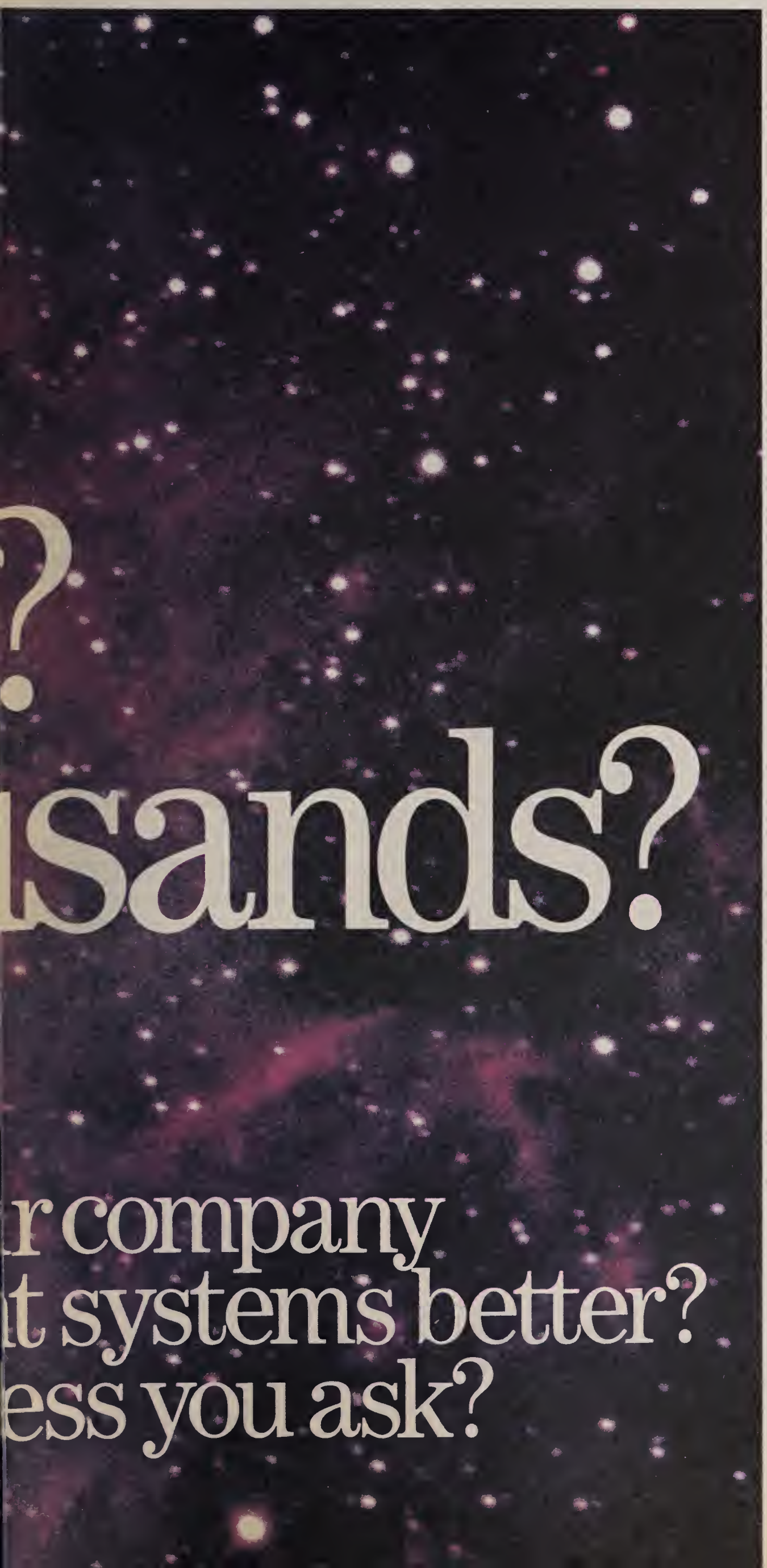

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Du Pont replaces IS exec

BY CLINTON WILDER
CW STAFF

WILMINGTON, Del. — In a move related to its massive cost-reduction plans, Du Pont Co. became the latest corporation to place an executive without direct information systems management experience in its top IS position.

Du Pont announced that Michael B. Emery, senior vice president of engineering, will take on the additional responsibility of senior vice president of IS when veteran IS chief Raymond E. Cairns Jr. retires at the end of the year. Emery was chosen to forge closer ties between IS and the business units, IS managers said, but he has also been a cost-cutting leader in the engineering function.

Earlier this year, Du Pont Chairman Edgar Woolard announced a plan for the $40 billion firm to cut $1 billion in costs annually in its chemicals and specialty products businesses.

Cairns' retirement plans were already in the works and were not affected by the cost-reduction plans, said Ed Mahler, manager of decision support in Du Pont's IS department. Cairns, a 29-year Du Pont veteran, will turn 59 in December and wants to spend more time with his family, sources said.

"He is truly retiring," Mahler said. "He is a close personal friend and mentor, and he will be missed, but I'm cheering for him going on to new things." Cairns could not be reached for comment last week.

Emery, 53, has been with the company for 30 years in engineering and business management positions.

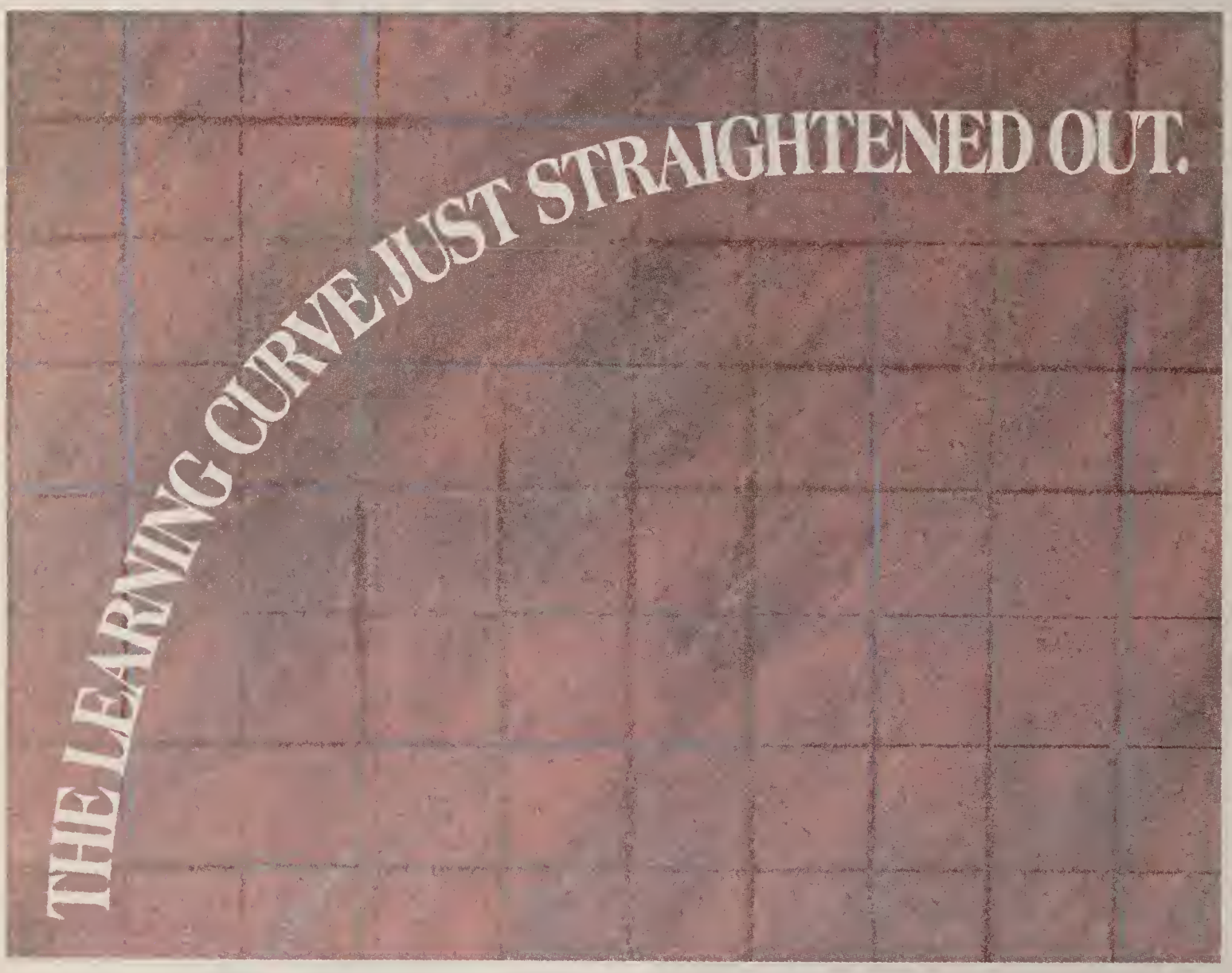
"Mike is the right person for IS at this time," said James Collins, manager of Du Pont's Open Systems Program Office. "He has a breadth of business experience and very strong relations with the corporate operating group."

Du Pont's Cairns *retires after 29 years in IS*

Du Pont is one of several large corporations this year that have replaced a premier member of the "old guard" — more technology-oriented IS executives such as Cairns, Merrill Lynch & Co.'s DuWayne Peterson and Mellon Bank Corp.'s George DiNardo — with a new IS chief from the business side. Collins pointed out, however, that Emery's engineering background fits with the IS culture.

Collins noted that Emery acted as corporate sponsor of a Digital Equipment Corp. All-In-1 office systems implementation when he was director of a Du Pont fibers unit in the early 1980s.

Emery could not be reached for comment.



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IBM printer line gets revamped

BY CAROL HILDEBRAND
CW STAFF

The independent printer group recently spun off from IBM trained its sights on Hewlett-Packard Co. with a comprehensive printer announcement complete with connectivity that will support almost any device short of a toaster oven.

"They've kind of surpassed all the standards that HP has set," said Marc Boer, an industry analyst at BIS Strategic Decisions in Norwell, Mass.

Citing the high-resolution features, Bill Gott, an analyst at Computer Intelligence/Infocorp, said, "I think they have really done their homework in terms of incorporating the functionality that users in an office environment really need in a printer."

Lexmark International, Inc. announced the 4029 series of four laser printers with a number of enhancements and options available across the board.

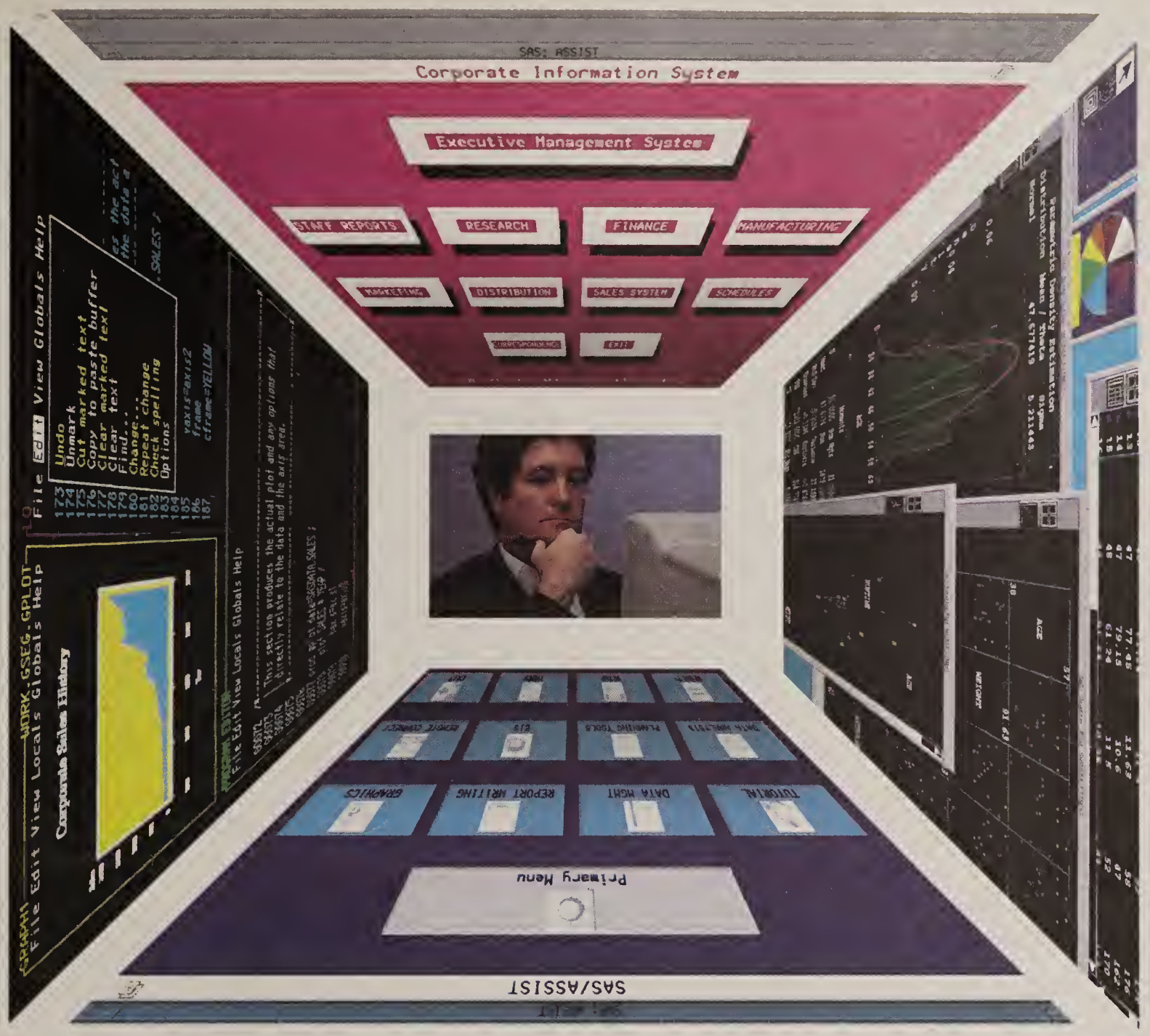
The leading option

Among the most strategic additions were the built-in Adobe Type Manager rasterizer and Type 1 scalable fonts from Adobe Systems, Inc. Users can rasterize the fonts — convert a digital image into a bitmapped one — without the need for expensive Postscript.

Another big feature is Lexmark's Print Quality Enhancement Technology. Similar to HP's Resolution Enhancement, it adjusts toner dot size to help sand down jagged curves on text and graphics. Three of the four printers offer 600 dot/in. resolution. The combination of the three will have a serious impact on the competition, particularly HP, Computer Intelligence/Infocorp noted.

The printers' high-resolution abilities should be of interest to users with desktop publishing needs, Gott said, particularly when coupled with the printers' connectivity features. Apple Computer, Inc.'s Appletalk will be an option on the new products, with availability scheduled for November.

"By offering the Appletalk interface, IBM has legitimized the 600 dot/in. option," according to a special report on the announcement from BIS.



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EDITORIAL

Afterthoughts

At a big PC conference last month, some 300 industry executives and developers were asked to weigh in on the following question: "Who will benefit the most from the IBM/Apple alliance?" It was a multiple choice question, and the choices were IBM, Apple, Microsoft and Borland.

From the back of the room came a lone, inquiring voice asking, "What about the customer?"

As an afterthought, the customer was added to the list of choices. No matter. The customer finished dead last anyway.

With the IBM/Apple alliance inked last week [CW, Sept. 30], the customer again is being treated to a vision of the future in which the face of computing is changed, perhaps radically so.

This particular vision includes multivendor hardware offerings that are more similar to one another than dissimilar. There is Unix-based software that will run on anything from a PC to a high-performance workstation to a General Electric toaster oven. There is standards-based multimedia for the masses (who knows what we'll do with it?) — all based on an agreement that will have two different companies cooperating like newlyweds in the morning and then butting heads selling hardware against one another in the afternoon.

Along the way, the alliance will seek to break the Intel/Microsoft duopoly in microprocessors and operating systems and bring a new standard to bear on the marketplace.

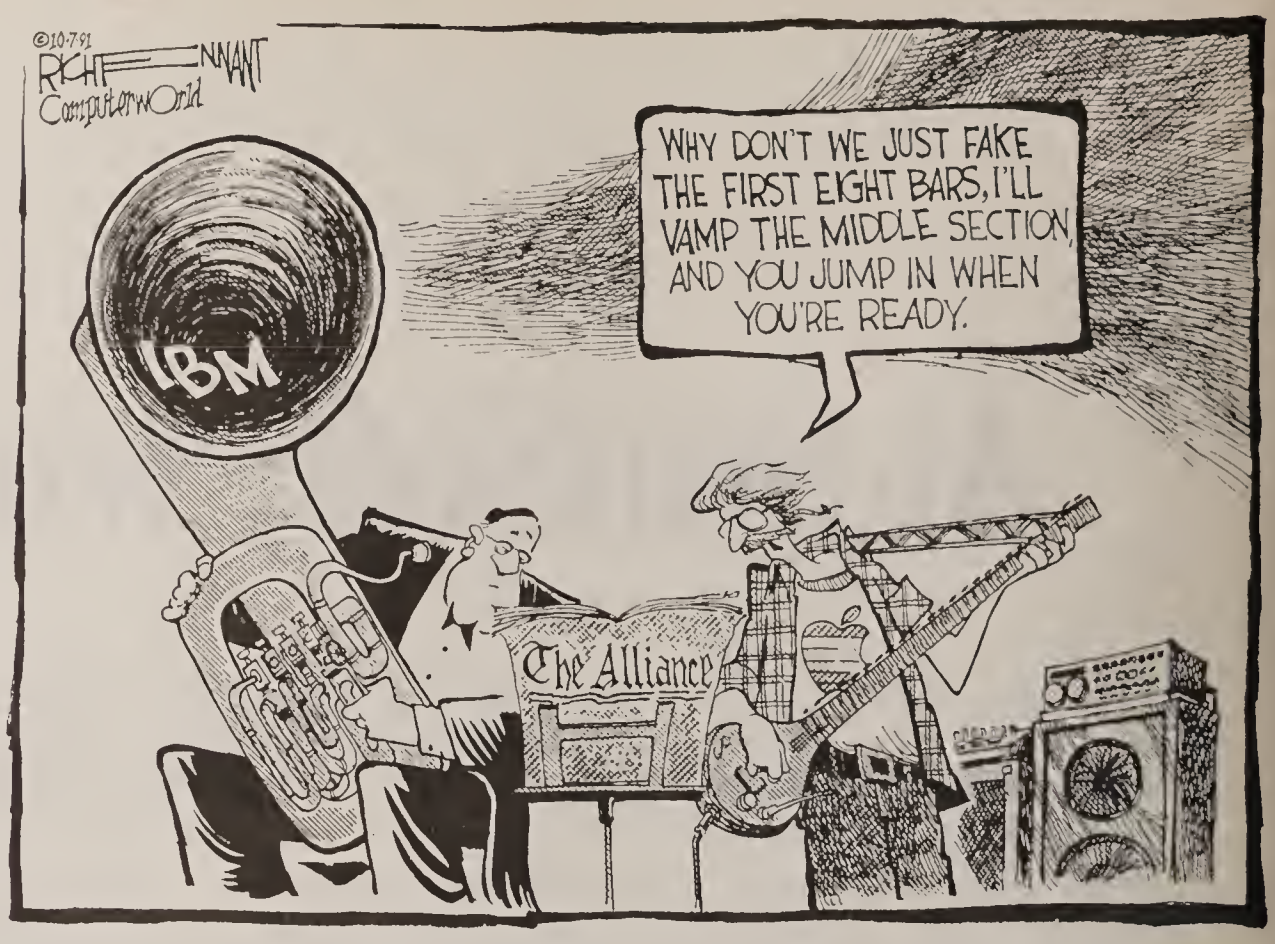
It's getting so you almost need a computer just to keep score on the number of aggressive standards-creating efforts under way in the vendor community today. But which computer to use? Running what standard software?

We try hard to dampen the inclination to be cynical. But if these various consortia and alliances bothered to ask the customers what they think, the vendors would find a growing cynicism and skepticism befitting the confusion vendors are sowing.

What does the cynic think of the IBM/Apple "Purple Alliance"? For one thing, the cynic will question IBM's ability to fashion and deliver a next-generation operating system when the development of OS/2 is stuck in mud. The cynic will question Apple's ability to lead development of next-generation hardware when it has been precisely Apple's inability to bring an innovative follow-on to the Macintosh that has stymied its performance in the corporate market.

And then there's the matter of getting hundreds of third-party software developers to commit limited research and development funds to support the promise of the next generation of desktop computing. As Steve Jobs and his Next company discovered, it can be mighty lonely in the market without a lot of this support.

The good news is that the first deliverables of the alliance will be enhanced Apple-to-IBM connectivity. That is pragmatic and user-driven. Beyond that, we have to ask, "What about the customer?"



LETTERS TO THE EDITOR

Join the club

In your article "Maintaining staff knowledge in frugal times" [CW, Sept. 9], you described a problem that is clearly plaguing the entire industry. There was one cost-effective remedy not mentioned in the article but worth considering.

In almost every metropolitan area, there are numerous professional organizations represented by local chapters. For the cost of annual dues and perhaps one meal a month, they offer opportunities for professionals to exchange experiences and ideas with peers from many sectors of the industry and to form valuable networks.

Employees can also gain valuable leadership experience at the local, regional, national and perhaps international levels. Many organizations also have timely speakers and low-cost seminars that present the latest trends and developments within the industry.

There are many reasons to join and support professional organizations, and in these times of lean training budgets, employers should strongly consider making this a priority.

John L. Horton
Certified data processor
Data Processing Management Association
Salt Lake City

Buyer beware

Unlike in years past when consulting firms were willing to maintain an "inventory" of consultants with the expectation that their marketing staffs would be able to locate suitable assignments, fewer consulting organizations now have the money to have a nonbillable employee on staff for any length of time.

Jan Daugherty's article "Consulting: Research before you commit" [CW, Sept. 16] reminding people to ask questions before committing to joining a consulting firm, missed one of the most important questions a prospective employee needs to ask: How long will the consulting firm keep me on the payroll if I am between assignments (or "on the beach")?

The answer has little to do with your performance but with your marketability at the time your assignment ends.

If the answer is scary or sounds fuzzy, don't sign on.

Jeff Altman
Vice president
Executive Directions, Inc.
New York

Prime concerns

I am responding to the small clip titled "Layoff ax hits Prime Info" in your Inside Lines column [CW, Sept. 16].

Prime Computer, Inc. has trimmed its sales and marketing force on par with other computer companies that sell and support minicomputer systems.

Regardless, our focus is still and will always be on the customer. Prime's dual-rail strategy is progressing on schedule. Dual-rail is a hardware development plan that is providing our customers with enhanced 50 Series systems as well as industry-standard Unix-based reduced instruction set computing systems. Migration tools to port applications among hardware platforms are currently being developed.

While Prime's focus has always been on price/performance, we are placing additional emphasis on developing improved redundant power supplies, disk mirroring and greater serviceability.

Dave Fernald
Vice president
Sales and marketing
Prime Computer, Inc.
Natick, Mass.

DG supporter

Regarding "Symmetric multiprocessing comes to PCs" [CW, Sept. 23], the following statement was made: "Below the mainframe level, virtually no operating systems take advantage of more than one processor . . ."

For the past two years, I have been supplying my customers with true symmetric multiprocessing Data General Corp. Unix. The entry-level server machine costs less than $10,000 and runs at 23 million instructions per second (MIPS), upgradable to 46 MIPS with a second processor installed. DG's high-end servers go from 29 MIPS to 116 MIPS with four processors.

Additionally, after 12 years of using and developing under various brands of Unix, DG/UX is the best I have seen.

Alan Moss
Workstations Products and Services, Inc.
New York

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80. Sys. Integrators/VARs/Consulting Mgt.
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51. Sales & Mktg. Management
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C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
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Addiction is our problem, too

CHARLES C. VARGA JR.

With revenue growth flat and profits at all but a handful of companies way down, is there anything that's going up in the computer industry? The answer is yes, but it's no cause for rejoicing. What's on the rise in our industry, as everywhere, is substance abuse.

All across the country, the impact of drug and alcohol addiction has been felt at every level from executive manager to computer programmer, systems analyst and service technician.

Mounting costs

In a recent conversation, one Fortune 100 IS executive described his division's experience with the following problem: "Out of a total of about 100 staff, we usually have about 3% at any one time who are at or near their personal bottom. One of our people is in rehab now and two more are about to go in."

The combined economic cost of alcohol and drug abuse to all industries was recently estimated to be at least $175 billion. An additional $135 billion can be added to that for lost productivity. For the computer industry, this translates to approximately $2 billion in economic cost and $1.5 billion in lost productivity.

Of the estimated 2 million people employed within all sectors of the computer industry, there are approximately 170,000 alcoholics. And although no one is quite sure of the numbers, the population of drug abusers is probably somewhere in the same vicinity. Using our own industry estimates of average revenue per employee, each of these addicts costs the industry roughly $79,000 per year just in terms of output not delivered.

Environmental impact

Furthermore, people in active addiction — and early recovery — adversely affect those around them. Families feel the strongest impact, but co-workers are also affected, sometimes to the point where their productivity also suffers.

What does this mean to you and me? It means dysfunctional workers, derailed projects, hobbled organizations and costly downtime at a point when we can least afford it. It can also mean increased risk of monetary losses due to fraud and theft, if the substance abuser must steal to support an out-of-control habit, or due to careless, damage-causing errors.

David Diaz

But the total cost of this disease can be measured in more than dollars and cents. There is also the human toll: the waste of talent and lives. Only 4% of all chemically dependent people get into recovery. Of these, 1% will probably relapse. The remaining 96% will die in active addiction.

So what's to be done? Basically, we need to increase our understanding that this is not a moral issue, not a legal issue, not even an ethical issue, but a medical problem that responds best to early intervention through something like an Employee Assistance Program.

The next time you're at a computer industry conference, a financial analysts' meeting or a new product announcement and the booze is flowing, look around you and consider the real cost of addiction. When systems crash, they can usually be brought around — check, reset, sysgen, restart. When people crash, they can die.

Varga is an independent consultant in Frenchtown, N.J.

Licensing bill is a tax package in disguise

READER'S PLATFORM

HARRY A. COZZI

On June 27, without benefit of public hearings, the New Jersey state assembly passed a piece of proposed legislation that seeks to require licensing of software designers in New Jersey by a soon-to-be-created State Board of Software Designers. This bill — Assembly Bill A-4414 — should not be viewed as something that applies only to computer consultants or as strictly a New Jersey issue.

It encompasses those who design, program, test, modify, maintain or document software — whether consulting employee or nonconsulting employee, contract programmer or independent consultant. Those living outside of New Jersey but working in the state are not excluded, nor are firms located out of state but selling products and services in New Jersey.

The New York/New Jersey Independent Computer Consultants Association (ICCA) has made a concerted effort to alert other professionals and the general public regarding this bill. Several professional associations and numerous user groups in New York and New Jersey have joined the ICCA in opposing the bill's passage.

To the best of my knowledge, no major professional groups or corporations have expressed positions favoring this bill. The press has quoted individuals favoring A-4414; however, I would caution legislators to remember that these individuals do not speak for the industry. Upon closer scrutiny, they will probably discover that such individuals fall into one of three categories: those seeking appointment to the nine-member board that A-4414 would create; those promoting and/or providing data processing-related examinations; and those seeking economic advantage by restricting or limiting competition.

Although the purported motivation for this bill is consumer protection, there has been no public outcry for protection from data processing professionals. More importantly, the passage of this bill would offer consumers no greater protection than they already have. A-4414 is not a consumer protection bill. It is, at best, a tax bill with a great many negative side effects.

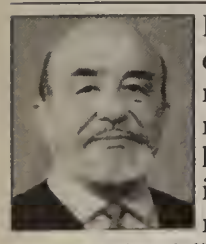
Any attempt to license data processing professionals by administering written examinations in the hope of "weeding out" those who may be unscrupulous or incompetent is doomed to failure for at least two major reasons. First, this is a field that is very diverse and is changing at lightning speed. As a result, the value of one individual over another is the concentrated and specific knowledge he possesses. Under these circumstances, it's hard to believe that any board could construct a totally fair and accurate test of who can practice "software design."

Second, you can't test for ethics. There can be no assurance that because someone has passed an exam and been licensed, he will behave ethically.

Cozzi is president of a Middletown, N.J., consulting firm. He also chairs a committee for the ICCA's New York/New Jersey chapter.

What would you do if your hard disk failed today?

CHARLES P. LECHT



Did you experience a sudden rush when you read that headline? Let's face it: Most people really aren't prepared for hard disk failure.

Some do have their data backed up on floppies, of course, but many do not. And even when this precaution has been taken, the floppies are usually in a state of disarray, with many versions of the same documents, cryptic file names, mystifying labels, bad dating and so forth.

I bring up this subject because I'm a victim myself. Last month, my hard disk controller crashed, obliterating the data on my hard disk. Much of it wasn't backed up, and what was existed in the kind of disarray described above.

Luckily, my disk wasn't full, and a lot of what was on it wasn't worth saving. Still, the failure did start me wondering about what practical recovery options are available for users who might have more to lose if they suffered something like a 314M-byte crash — really practical options as opposed to the wholesale use of floppies.

I know, if you have 314M bytes of hard disk, you aren't using 5¼-in. floppies. You are probably using those 1.44M-byte 3½-in. types. Even so, for a 314M-byte hard disk, you need 221 of them to back up a full disk.

No reasonable person can be expected to manage that many floppies without error, and no reasonable person would feel fully confident that none of that large a number would fail. So to increase the probability of success in restoring data to another hard disk when your current hard disk fails, you really should make two backup copies. In case you've lost count, that means 442 3½-in. floppies to keep labeled and current. You could use another computer to do this, but then you'd have to back up its hard disk, too.

Granted, you could use one of those fancy data-compression programs to drastically reduce the number of floppies, but you'll be dependent upon that program to unpack the data.

One alternative to floppy storage is an auxiliary hard disk. Of course, if you are operating at nearly full capacity on the primary hard disk, only the latest backup may be kept this way. Since the volume of data you wish to keep on record may be larger than the capacity of one hard disk, you may need multiple hard disks to maintain it.

Even if only one auxiliary hard disk is involved, keeping a perfect record of what's on the primary hard disk on an auxiliary hard disk by constantly copying Disk A to Disk B is beyond the capabilities of most normal people. In fact, when most people have two hard disks to use, they invariably end up using them for different purposes.

Of course, what we'd all really like would be for manufacturers to make desktop and laptop units with automatic mirror-disk facilities. The problem is that supporting a mirror disk would increase the cost of a desktop machine by as much as 50%.

You may wonder why I haven't said anything about the 135M-byte optical disc memories available for most PCs. The reason is that I'm leery of this alternative. Optical technology is changing very rapidly. What assurance do we have that these discs, or even the devices to read them, will be available in a few years? Then there's the issue of reliability. Think of how frequently your CD player fails to appreciate the possible inherent unreliability in this technology. We can overlook missing a little Mozart now and then, but, well, you know what I mean.

All in all, the best thing we can do is hope that large-capacity card memories soon become practical enough to make rotating disk devices obsolete.

Lecht is an IDG News Service foreign correspondent based in Tokyo.

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When an office doesn't work, it's a people issue, right?

When productivity falls, it's a people problem, right?

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Clearly, throwing more people, or different people, at the problem doesn't solve it.

But something else does. Something unconventional.

There are dozens upon dozens of enterprises—companies, government agencies and universities—which have made dramatic gains with essentially the same people working in their offices and departments.

In the credit card division of a major financial institution, customer service response time was slashed from as long as four days to just minutes.

In the accounts payable department of a leading consumer products company, the time it took to file in-coming checks, invoices and requisitions went from a two-to-three-month backlog to instantaneous filing the moment they arrive.

And, the corporate legal department of an aerospace firm realized a 60% reduction in trial preparation costs.

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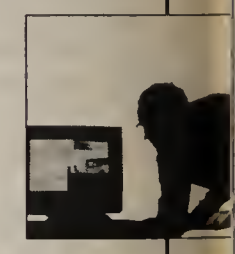

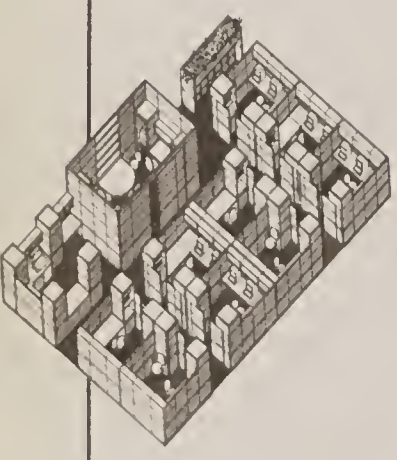

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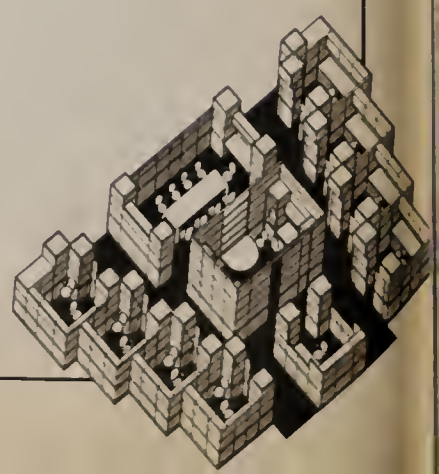

NEW DEALS

Unisys still at State

Unisys Corp.'s government systems subsidiary has renewed a professional services contract with the U.S. Department of State's Office of Foreign Missions (OFM) to provide service, software and hardware. Unisys has been under contract with OFM since 1986. The potential value of the contract, with options for three one-year renewals, is $10 million.

The Unilever Group of Cos. in India has chosen Digital Equipment Corp.'s India office as its major information technology partner in a nationwide computerization program. The agreement could be worth $12.5 million over the next five years, DEC officials said. The program will be India's largest commercial computing endeavor to date, eventually connecting Unilever's India head offices in Bombay and Bangalore with 76 factories, 40 branch offices and more than 2,000 distribution centers.

The National Cancer Institute has installed an eight-processor Cray Y-MP system, the largest system offered by Cray Research, Inc., for biomedical research. The new system was installed at the institute's Frederick Cancer Research and Development Center in Frederick, Md.

Prime's dim future leaves users leery

BY SALLY CUSACK
CW STAFF

FRAMINGHAM, Mass. — A recent round of layoffs at the financially faltering Prime Computer, Inc. has left many users unsure of the minicomputer maker's ability to survive.

"Right now, we are nervous," said Michael O'Rear, director of operations at the University of Southern California at Los Angeles. The university has 14 of Prime's proprietary 50 series computers running financial and administrative applications.

Prime's McMullan: *Focus will be on customers' needs*

O'Rear said he is 100% behind Prime's products, particularly the Information database software, and has always enjoyed excellent service and support.

However, USC will be looking to upgrade or purchase a new machine within the next 12 months, and right now it will not commit to Prime or any other vendor. "I'm sitting on my money," O'Rear said.

Prime has cut more than 800 people from its work force since the beginning of the year and plans to lay off an additional 900 out of the current total of 7,300 employees by the end of 1991.

Eric Atanda, manager of telecommunications at Hamamatsu Corp. in Bridgewater, N.J., and a longtime Prime customer, said the company has put upgrade purchase plans on hold while evaluating the situation.

Having considered both 50 series and the Unix-based EXL line of computers from Prime, Atanda pointed out that the vendor is still fairly new in the Unix world and is largely unproved.

Prime's financial viability is also a concern, he said.

Another heavily invested Prime user, Bruce Kerns, director of MIS at Alumax, Inc. in Norcross, Ga., observed that the recession has caused Prime unexpected problems this year. He is concerned that the latest round of layoffs will have an effect on projects currently being researched and developed.

Prime is still touting what it calls a dual-rail strategy as the solution for migrating proprietary users to Prime Unix-based EXL boxes. Dual rail is the vendor's intent to enhance the 50 series for existing customers until they are ready to migrate to an open environment on the EXL. This will allow customers to keep their Prime Information software investment intact.

> "I HAVE JUST BET my job on my belief that the field is sized correctly for our level of business over the next three years."
>
> NEIL MCMULLAN
> PRIME

However, many users are delaying upgrade plans or leaving the product line altogether.

Continued on page 32

VAX 6000 tops list in user satisfaction poll

BY KIM S. NASH
CW STAFF

DELRAN, N.J. — Upgradeability and reliability helped the VAX 6000 best the rest of the midrange systems market, according to a recent user survey by Datapro Information Services Group.

The DEC line edged out last year's winner — Hewlett-Packard Co.'s 3000 series — for the top spot, said Judy Watson, product manager at Datapro, which is based here. The VAX 6000 moved up in the ranks this year after finishing third last year.

Users gave the VAX 6000 high marks for upgrade capability and system reliability, said Watson, who designed the annual Midrange Honor Roll survey. Datapro canvassed 5,000 U.S. sites, which were chosen at random from a database of midrange users at Computer Intelligence/Infocorp. The response rate was 13%, or 650.

This year's ratings were close (see chart) because midrange systems are well-entrenched in the market and because of the "solid" enhancements vendors have made over the years, Watson explained.

Additionally, the survey unearthed user indecision about how to reconfigure centralized operations. About three-quarters of the respondents said they now have centralized computing operations, while just 38% will be centralized in another year. However, when asked what alternative setups they will be moving to, a few people indicated definite plans for client/server or distributed solutions, but the majority left the question blank.

Overall, users seem pleased with their vendors, with 85% saying they have no plans to switch suppliers within the next 12 months, the survey found.

The HP 3000 won a special merit award for the superior grades users gave it for service and support. Users particularly liked HP's service troubleshooting capabilities and responsiveness, according to Watson. Last year, the HP 3000 Model 70 took first place, and another HP 3000 model tied with the Data General Corp. MV series for second.

By a nose

Digital Equipment Corp.'s VAX 6000 beat out the HP 3000 for top honors in Datapro's midrange systems user satisfaction survey

System	Overall satisfaction rating
DEC VAX 6000	4.34
HP 3000 series	4.33
IBM AS/400	4.21
IBM System/38	4.15
DEC VAX 8000	4.13
DEC Microvax	4.13
PRIME 50 Series	4.00

- Systems scored from 1 to 5, with 5 the best.
- To be ranked, systems had to score above 3 in all 10 user satisfaction categories.

Source: Datapro Research Corp. CW Chart: Janell Genovese

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Bell Atlantic plans $1B switch to Systems 2000

ON SITE

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — When Bell Atlantic Corp. thinks new systems, it thinks big.

The communications firm is embarking on a nine-year, $1 billion project to rebuild some 400 applications supporting 120 business functions from the ground up. Fifteen of the applications are real whoppers, such as the $130 million system that will revolutionize 6,500 users' jobs.

Rather than automating activities and enhancing them over time, Bell Atlantic is among a growing number of long-established enterprises convinced that re-engineering the underlying business functions will provide the big payoff in the future.

Joseph T. Ambrozy, vice president of information systems, estimated that simply upgrading older technology would have improved efficiency by only 10%.

Under the banner of Systems 2000, Bell Atlantic will move away from an IBM mainframe-centered architecture — the company has 30 at six data centers, surrounded by tens of thousands of dumb terminals — in a shift toward open systems. That shift encompasses peer-to-peer computing and workstations on wide- and local-area networks, using the mainframes as corporate file servers. LAN-based Unix workstations and servers will tie into the 45M bit/sec. Bell Atlantic Internet backbone, which will link the MVS-based data centers.

A key part of the plan is to separate data, applications and users into three distinct layers so applications can access data in standard ways and users can access applications without having to understand the idiosyncrasies of multiple systems.

Ambrozy: *Reduced maintenance costs by 20%*

The challenge of doing such a fundamental overhaul is compounded by the fact that Bell Atlantic, one of the seven Baby Bells spawned by the AT&T divestiture, was originally seven different telephone companies. "We have at least three of everything," said Harry Artz, director of IS and strategic planning. "Systems 2000 is to get us to just one of each system."

Bell Atlantic split the functions to be re-engineered into three groups: those supporting residential and small businesses; large businesses; and long-distance carriers that attach to Bell Atlantic's local networks.

For residential and small businesses, the firm will rebuild its business practices and the systems that support them to allow customers to order and receive services 24 hours a day — through a single point of contact or, in some cases, via voice-response systems.

At the heart of those capabilities will be the Sales Service Negotiation System (SSNS). The SSNS is intended to move Bell Atlantic away from the mindset that phone companies tell customers what to buy and toward a competitive environment where buyers are given what they want and need (see story this page).

The estimated $1 billion price tag for Systems 2000 is in addition to Bell Atlantic's existing $650 million annual outlay for IS, but the company hopes to pick up some of the needed funds from cost savings. Artz said he is looking for "white chips" — savings from the elimination or merging of similar processes. "We're leaving no rock unturned. We're spending millions of dollars on redundant systems and data."

Artz said Bell Atlantic is also looking for "home runs" — short-term actions that provide big paybacks while long-term solutions are being sought. For example, a recent two-month study of order processing turned up a way to significantly reduce processing time and cost through better manual methods.

Bell Atlantic is also funding development using savings from lowered software maintenance costs. Ambrozy said the firm has reduced maintenance costs by 20% by using development methodologies and computer-aided software engineering.

Ambrozy said it is not yet clear exactly how much Systems 2000 will cost or even how it will be funded. He noted that Bell Atlantic has some 6,000 IS projects ongoing at any time, and some of those will have to be eliminated or put on hold.

At a glance **Bell Atlantic**

Bell Atlantic hopes that its Systems 2000 project will help it re-engineer a sprawling organization

1990 sales/profit:
$12.3 billion/$1.3 billion

Annual expenditures for IS including payments to Bellcore:
$650 million

Key business segments:
Voice and data network services; cellular and paging communications; business systems; financial services; international communications and information services

Source: Bell Atlantic Corp. CW Chart: Michael Siggins

May I take your order?

When one of Bell Atlantic's 12.8 million customers calls in to one of the company's 169 business offices for a new service, he can expect a 20-minute question-and-answer session. During that time, one of 6,500 service representatives is probably thumbing through huge manuals looking for price, technical specifications or other information while logging on to multiple user-hostile, mainframe-based systems.

That order taker's job will get harder as the number of Bell Atlantic's services explodes over the next few years, said Robert A. Gardner, director of sales service negotiation systems. "We are right on the verge of much more complex order taking."

Bell Atlantic hopes the answer to that challenge lies in replacing the 1970s-era hodgepodge of service-order systems with the SSNS, which will substitute intelligent networked workstations for dumb terminals, on-line databases for paper documents, English language commands and responses for arcane system codes and artificial intelligence for much of the human judgment currently required.

Gardner said Bell Atlantic now sends order takers 19 million pages of documentation annually. With the SSNS, those updates will be done electronically.

Bringing up the SSNS will take several hundred people five years, and cost will be between $70 million and $130 million, of which 40% will be for software and 60% for hardware, Bell Atlantic officials estimated. It will have these major components:

- 8,000 Sun Microsystems, Inc. Unix-based workstations on LANs at 169 business offices.
- Support software in conversational English running on an IBM 3090 mainframe under MVS and on Sun servers will prompt the order taker to ask questions based on customer requests and responses.
- An expert knowledge-based sales tool to help order takers match available services and options with customer profiles.
- Databases of text and product data to replace reference manuals.
- An interface module that translates orders to the formats needed by the various local telephone company order systems.

The underlying premise for the SSNS is "needs-based selling," Gardner said. For example, the statement, "I'm a doctor working at home, and I have children," would trigger the SSNS to suggest telephone options appropriate for that profile.

Thinking Machines, IBM pact foggy

BY MARYFRAN JOHNSON
CW STAFF

IBM placed a few bets on the massively parallel track last month when it announced a rather mysterious new alliance with Thinking Machines Corp. in Cambridge, Mass.

The mystery lies not so much in IBM's interest in the growth potential of this $141 million niche market but in the paucity of detail about the alliance itself. Neither company is willing to discuss joint products, marketing plans or any specifics of the agreement.

A few aspects are clear, however. Mutual need is one.

IBM wants its Enterprise System/390 mainframes to work in concert with Thinking Machines' systems, which only Digital Equipment Corp. and Sun Microsystems, Inc. computers can do now.

The deal also clears the way for IBM to sell more of its own disks and semiconductor chips to Thinking Machines.

"There's an old joke that a supercomputer is a system the disk drive manufacturers will give away for free — if you buy enough disk to support it," said Christopher Willard, an analyst at San Jose, Calif.-based Dataquest, Inc.

Need of green

Financial need is another compelling reason behind the alliance. "Companies the size of Thinking Machines don't have enough money to do it all," Willard said. Development costs for a new generation of midsize supercomputers, for example, can run $30 million to $50 million.

While money may not present a big hurdle for IBM, competition certainly threatens to throw up some future roadblocks.

DEC is allied with Maspar Computer Corp., and DEC salespeople are now selling Maspar's MP-1 massively parallel systems. Cray Research, Inc. is also busy developing its own massively parallel system.

"IBM is getting worried about missing out on the interest in massively parallel systems," said Omri Serlin, president of Itom Interational Co. in Los Altos, Calif. "They have nothing of their own to offer, although there are a number of research projects under way."

One of those projects is a 3-year-old venture with Steven Chen's Supercomputer Systems, Inc., which is developing a 64-processor highly parallel vector supercomputer. The Chen project is a long-term answer for IBM, Serlin added, and is unlikely to interfere with any short-term benefits from the Thinking Machines alliance.

"This relationship between IBM and TMC will make people in business take the whole area of massively parallel computing more seriously," said professor Roscoe Giles, a council member of the Center for Computational Science at Boston University, which installed a Connection Machine in 1988.

Rational, Cadre unwrap object-oriented tools

BY JOHANNA AMBROSIO
CW STAFF

Two vendors recently unveiled competing products to design object-oriented applications.

Rational Rose from Rational in Santa Clara, Calif., is meant for both analysis and design of object-oriented applications, while Teamwork/OOD from Cadre Technologies, Inc. in Providence, R.I., is intended for design only. Cadre sells a separate tool, Teamwork/OOA, for analysis.

Both products run on Unix machines and are installed at small numbers of user sites that have been beta-testing the software. Teamwork/OOD is available now for Sun Microsystems, Inc. Sun 4 workstations for $2,775 and is running at approximately 10 installations, including AT&T, the company said.

Rational Rose is being beta-tested at one shop that Rational would not identify and will be generally available in February for $3,995 on the IBM RISC System/6000 and Sun Sparcstations. Jon Williams, Rational's marketing manager, said that by year's end there will be approximately 100 installations.

Other platforms will follow those already announced, both companies said.

Terry Bennett, an analyst at Computer Intelligence/Infocorp in Portland, Ore., said that to his knowledge the Teamwork/OOD product is "the first work-group tool for building object-oriented applications. It's an important step because the hang-up with object-oriented has been that it's not suitable for groups of people working on large software projects."

Paul Bloom, an analyst at Volpe, Welty & Co. in San Francisco, said that both products will likely be received better in the technical software development market than in commercial information systems shops. "This is not an MIS type of product. It will be a long time before MIS learns object-oriented anything," he said.

Teamwork/OOD supports Project Technology, Inc.'s Recursive Design methodology and Oodle graphical notation, while Rational Rose supports the Booch method. Lou Mazzucchelli, Cadre's chief technical officer, said that Teamwork can also be used with other methodologies and notation methods.

Rational has "closely coupled their notation and their tools, and we have not," Mazzucchelli said. "Is that good or bad? I don't know. It comes down to a matter of personal choice."

Another difference is that Teamwork/OOD automatically generates C++ code, while Rational Rose is language-independent. Users can choose from among any of the object-oriented languages to work with Rational Rose, including C++ and Smalltalk, but must compile the code in a separate step.

Williams said that his company's product is "a full-fledged object-oriented system, not a hybrid approach that has its roots in the structured world. Teamwork/OOD is a hybrid."

Mazzucchelli responded, "Our product reflects a real-world view about building real-world systems."

Storage Tek opens to Unix

BY JEAN S. BOZMAN
CW STAFF

LOUISVILLE, Colo. — Storage Technology Corp. decided to reach out and touch Unix servers recently, adapting its family of tape-cartridge drives to connect with them. Using the new drives, Unix servers can, for the first time, store data files on Storage Tek's 4400 Automated Library System.

Until now, the library system worked only with large-scale systems, including IBM-compatible mainframes, Unisys Corp. mainframes, Digital Equipment Corp. VAXs and Cray Research, Inc. machines.

The new Storage Tek 4780 tape-cartridge drives connect with the Unix machines through a small computer systems interface in the 4781 controller. Each cartridge holds 200M bytes — the same amount of uncompressed data stored on IBM 3480 tape cartridges. A minimum configuration subsystem of one 4781 controller and two 4780 tape transports is priced at $96,000.

Storage Tek executives said the 4780 is only the first in a family of open systems peripherals it is developing in response to the growth of Unix systems. The drives are currently available for computers made by Sun Microsystems, Inc., Pyramid Technology Corp., NCube Corp., Alliant Computer Systems Corp. and Solbourne Computer, Inc.

Industry analysts said the drives are part of an overall Storage Tek strategy that views Unix machines as strategic IS platforms. "Unix servers are increasingly being used as central repositories for data," noted Bill Sines, director of midrange system research at Technology Investment Strategies Corp. in Framingham, Mass. "These machines are often equivalent to midrange mainframes. The question for IS managers is this: How are they going to be backed up?"

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Gary S. Idle
Senior Computer Scientist
Computer Sciences Corporation

"It is a good tutorial . . . I feel comfortable with this software. I have the skills to build simple systems."
Margaret Kubaitis
Research Programmer
University of Illinois

"This was a good learning experience . . . well written . . . easy to follow. The tutorial gave me a taste of the different capabilities of the IEF and how they tie together to produce systems."
Richard L. Duncan
Database Systems Analyst
PARS Service

"The tutorial takes you through the systems developmenf life cycle very quickly and gives you an overview of the entire toolset."
David A. Egensperger
Programmer / Analyst
The Lubrizol Corporation

"Instructions were very explicit which was extremely helpful and the model we created was easy to relate to."
Michael Young
Programmer / Analyst
Datacorp Business Systems, Inc.

"I was very favorably impressed. The tutorial gave me the training I needed and the flexibility to do it on weekends and after work."
Julie B. Dobbs
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New SAS gear handles larger records

Upgraded software handles 80% of production data for the company's service to seven states

BY SALLY CUSACK
CW STAFF

CARY, N.C. — SAS Institute, Inc. recently released an enhanced version of its System 2000 data management software that supports larger records in databases. Currently running at 200 sites worldwide, System 2000 is a hierarchical package that runs under the IBM MVS and CMS operating environments. SAS acquired the product from Intel Corp. in 1985.

Highlights of Version 12 include expanded file limits for database records and components, dynamic file allocation for MVS, complete CICS command-level support and full 31-bit addressing support.

Randy Horne, a systems programmer at the Tennessee Valley Authority (TVA), uses System 2000 software to store and manipulate 80% of the company's production data.

The TVA provides electric power to consumers in seven states and houses two IBM 3090-class mainframes at the Chattanooga, Tenn.-based data center. Horne said he supports production in four multiuser regions.

This translates into approximately 10,000 terminals with access to System 2000 via Systems Network Architecture/VSAM connections.

Horne said the new release incorporates many requests from users, including additional user exits and database read-only capabilities.

"There are 30 to 40 different exit points at the code level," Horne said. "You really don't run into too many vendors that offer that level of customization."

What Horne said he likes best about System 2000 is its support, stability and recovery capabilities — in that order. He also said he likes the software's ability to work with IBM's DB2 relational database product.

Admitting that DB2 is beginning to "edge into" his System 2000 domain, Horne said this really does not create any problems. The two programs work well together via SAS Access, a bridging program developed by SAS.

"Our applications here are extremely varied — flood controls, navigationals, financials and inventories," Horne said. "We also have an enormous amount of SAS 6.0 out there."

The SAS System is the software vendor's flagship product. It is a statistical and applications development environment that can be used in both single and multiuser configurations on a variety of hardware platforms.

Via SAS Access, end users at the TVA can use System 2000 with SAS 6.0 in a point-and-click environment.

The TVA is currently running Release 11.6 of System 2000 and is moving to the newly announced Release 12 at the beginning of the year.

First-year license fees for Version 12 range from $8,050 to $35,000.

Prime

CONTINUED FROM PAGE 27

Sales of the 50 series machines are down 40% from last year.

"The erosion of the installed base has accelerated at an alarming rate," said Thomas Willmott, vice president at Aberdeen Group, a Cambridge, Mass.-based research and consulting firm. "If they can't get their high-end CMOS machine out the door, they are in big trouble."

Neil McMullan, president of Prime's Computer Systems Business Unit, said in a recent interview that Prime will continue to provide a flow of modernized, CMOS-based 50 series products to the installed base, including a multiprocessor with board-swapping upgrade capabilities to a Unix environment.

The company will also be porting PI Plus, the Unix-based version of Prime's Pick-like database software, onto other vendor platforms as part of the dual-rail strategy.

Referring to the layoffs, McMullan said, "I have just bet my job on my belief that the field is sized correctly for our level of business over the next three years."

McMullan said he will be announcing a comprehensive business strategy within the next 30 days, which will include actively soliciting new customers via the value-added reseller market. He said Prime will succeed based on its reputation for quality, service and support in the value-added reseller marketplace.

McMullan emphasized that "the focus of the business will be on the needs of the customer — if necessary, to the exclusion of everything else."

Matt Weber, technical board chairman for the National Prime Users Group (NPUG), said concerned NPUG officers will be meeting with Prime executives early this month to plan future strategies and relationships.

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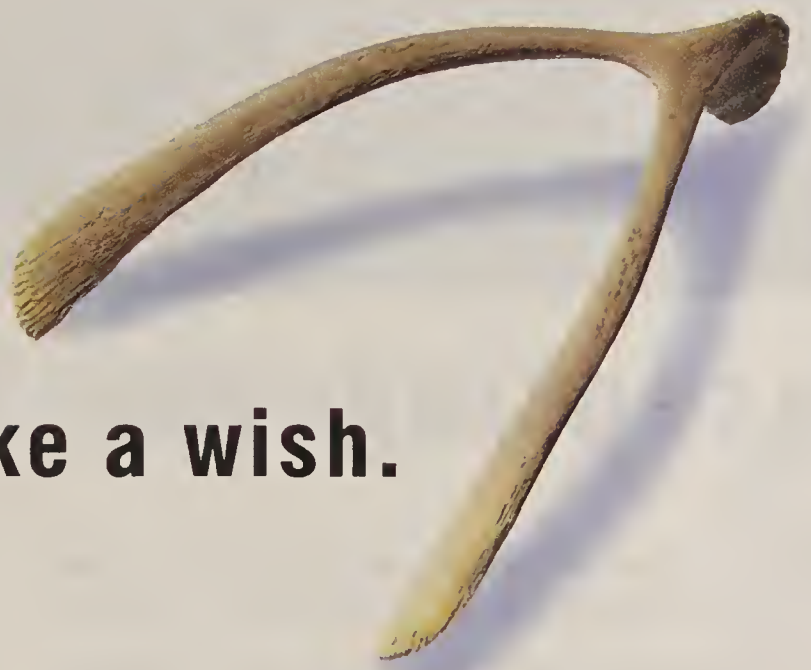

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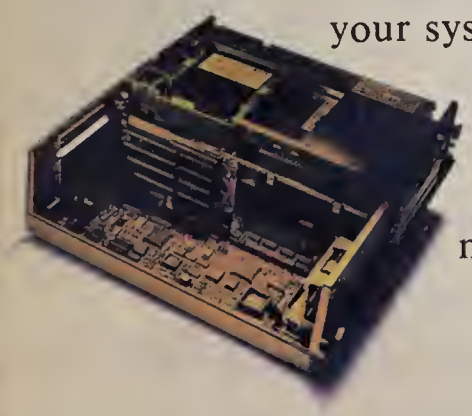

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NEW PRODUCTS — HARDWARE

Data storage

EMC Corp. has unveiled the Symmetrix series of Integrated Cached Disk Arrays (ICDA) for Unisys Corp. mainframes.

The Symmetrix ICDA architecture is based on redundant array of inexpensive disks technology. It uses 5¼-in. disk drives and employs mirroring as well as caching for enhanced performance. Up to 24G bytes of storage is provided.

Unisys 1100 and 2200 systems are supported. Prices range from $150,000 to $475,000.

EMC
171 South St.
Hopkinton, Mass. 01748
(508) 435-1000

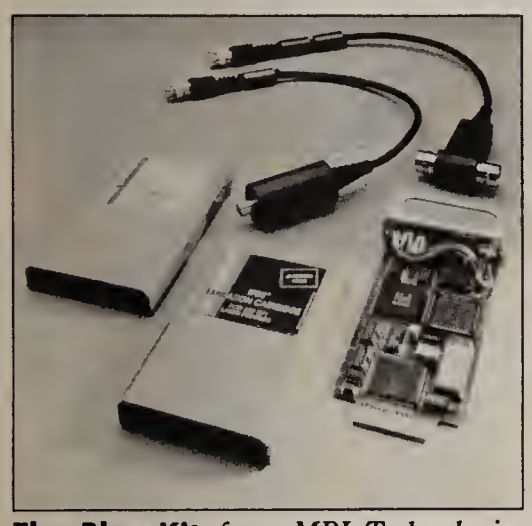
I/O devices

MPI Technologies, Inc. has devised the Blue Kit, a connector allowing mainframe and midrange computer users to access Hewlett-Packard Co. Laserjet printers.

The Blue Kit provides coaxial and twin-axial connection and emulates IBM's Intelligent Printer Data Stream host-to-printer page description protocol.

The kit is priced at $2,600.

MPI Technologies
Suite 301
4952 Warner Ave.
Huntington Beach, Calif. 92649
(714) 840-8077



The Blue Kit *from MPI Technologies allows access to HP Laserjet printers*

Concurrent Computer Corp. has announced the Intelligent Bus Interface Module (IBIM) I/O subsystem.

The IBIM, currently available for the company's real-time Unix computer series, is intended for use with high-speed data acquisition applications such as radar, sonar, wind tunnels and engine testing, according to the company. It includes an optional math coprocessor and provides a second separate 80M byte/sec. parallel port for connection with external devices.

Pricing ranges from $3,400 to $5,400.

Concurrent Computer
106 Apple St.
Tinton Falls, N.J. 07724
(908) 758-7000

SOFTWARE

Applications packages

The System and Computer Evaluation and Review Technique (SCERT) Version 3.0 is now available from Pinnacle Software Corp.

SCERT is a capacity planning software product for MVS systems. The new release includes an interactive data entry and verification system, on-line Help, advanced graphics and an enhanced Performance Library. The price is $49,500.

Pinnacle Software
5185 MacArthur Blvd.
Washington, D.C. 20016
(202) 537-2700

IBS Corp. has announced an upgrade of Quick-Conference for XA and Enterprise Systems Architecture mainframe platforms.

Quick-Conference performs conferencing, recording and auditing functions in training and monitoring users. Release 3.1 includes Script Relay and Message Broadcast features; a new Export/Import feature passes scripts to other CICS systems. The product costs between $12,000 and $20,000.

IBS
12626 High Bluff Drive
San Diego, Calif. 92130
(619) 792-0273

Unix software

Unix Systems Laboratories, Inc., a subsidiary of AT&T, has released C++ Standard Components Release 2.0.

The product is a source-code library of low-level C++ language routines that speed application development, the company said. It is available for Unix systems.

Pricing is set at $1,500 for the initial processor license and $1,000 for additional processors.

Unix Systems Laboratories
190 River Road
Summit, N.J. 07901
(908) 522-5006

Visual Edge Software Ltd. has developed UIM/X 2.0, a graphical user interface (GUI) development tool for the Open Software Foundation's Motif under Unix.

UIM/X 2.0 ($5,000) provides a GUI Builder Engine and configurable editors, allowing users to customize their tool set.

Visual Edge Software
3870 Cote Vertu
St. Laurent, Quebec H4R 1V4
(514) 332-6430

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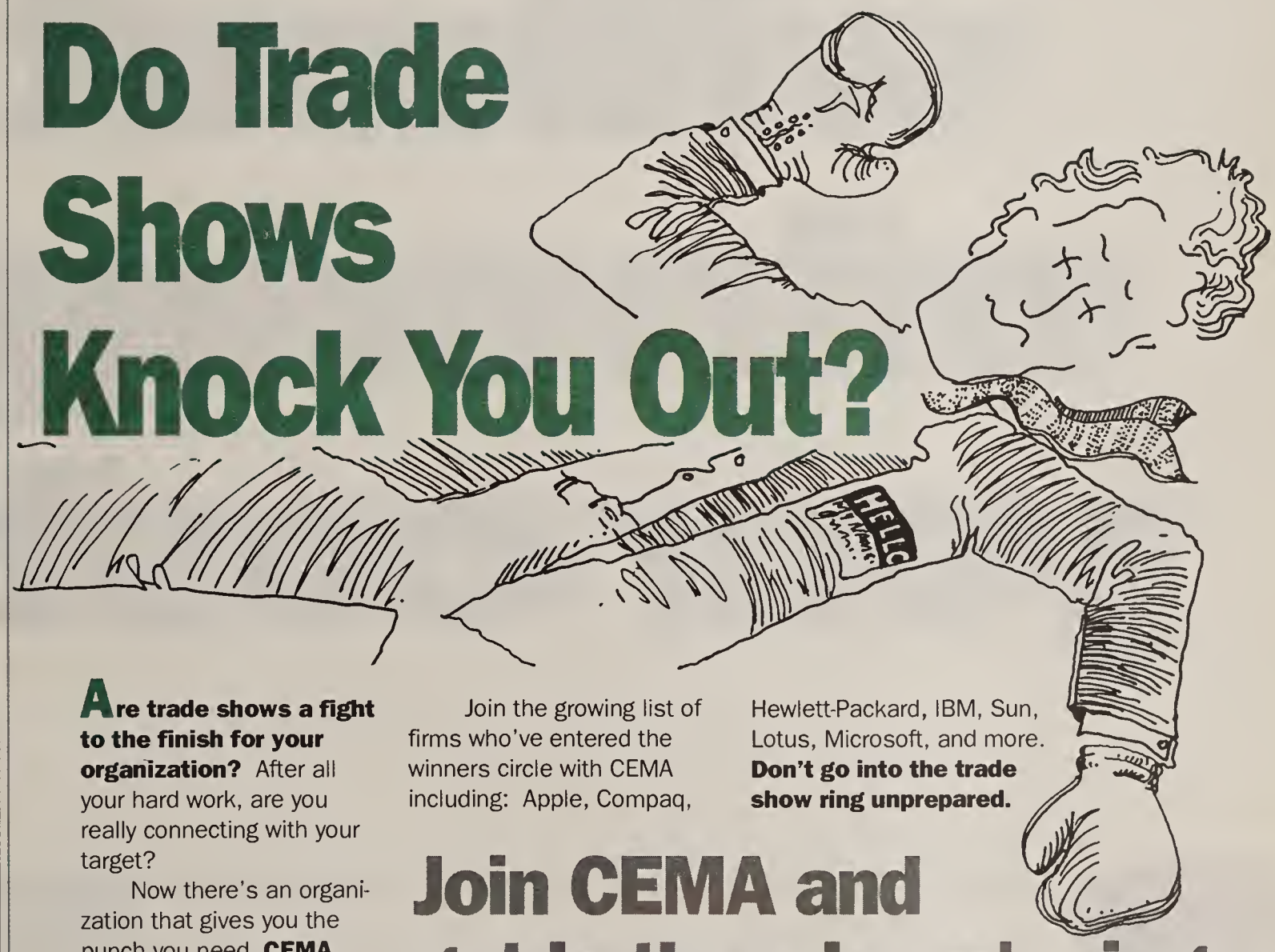

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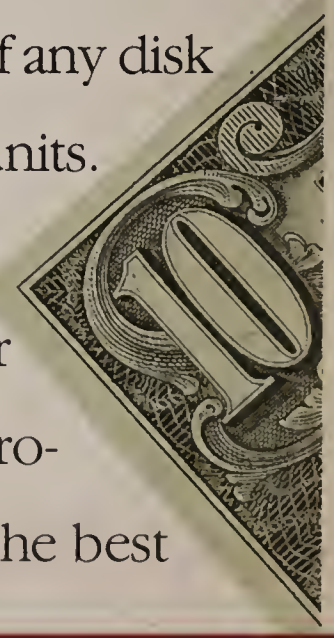

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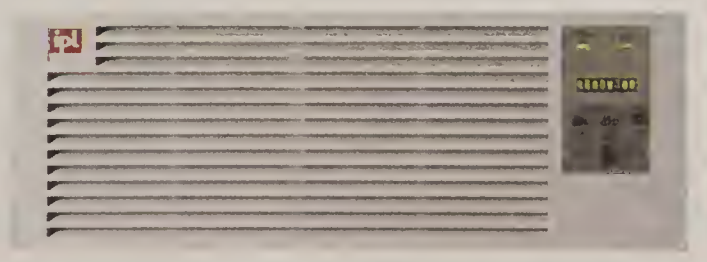

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COMMENTARY

Jesse Berst

Big GUIs on campus

Welcome to my new twice-monthly column on the graphical user interface (GUI). In this first installment, I'll explain why GUIs such as Windows and Presentation Manager make IS professionals more important than ever before.

In the 1980s, it was fashionable to claim that IS departments had lost control of the desktop. Personal computing was the wave of the future, and IS management was irrelevant.

But the advent of GUI computing has brought new respect. "Two years ago we were lucky if 30% of all purchases followed our recommendations," admits Daniel Willis, a senior analyst at 3M Information Systems.

Today, Willis advocates Microsoft's Windows as a corporate standard, and, he says, "more than 70% now follow our guidelines."

This renewed regard results from a new understanding of where GUI computing is taking us. Yes, the GUI brings individual productivity gains. But its biggest potential is as the integrating element for networked, companywide computing. Whether you call it "enterprise computing" (a la IBM) or "infor-

Continued on page 66

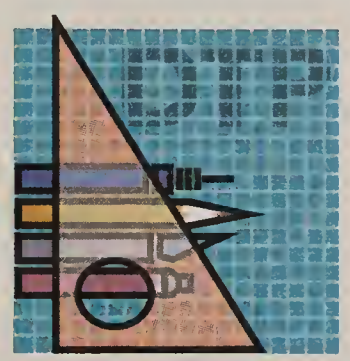
Apple printers ease graphic integration

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — Pictures were worth a lot more than a thousand words at last week's Seybold Computer Publishing Conference & Exposition — the ability to understand the reams of information personal computers typically generate often depends on them.

While the proliferation of the PC has streamlined information gathering, the glut of data that PCs produce sometimes clogs, rather than clears, corporate information arteries. "We've shipped millions of PCs, and what we have now is more paper, more [electronic mail] and not enough time to sort through all the information," said Duane Schulz, director of image product marketing at Apple Computer, Inc. "The challenge is no longer to create documents but get them noticed."

Apple tried to do its part toward making that wealth of information easier to digest when it introduced two laser printers, a scanner and a 21-in. color monitor.



The Laserwriter IIF and Laserwriter IIG will replace the Laserwriter NT and NTX printers. The new printers will employ two new Apple technologies that both smooth the jagged edges characteristic of laser-printed text and ease the incorporation of pictures in documents.

The Laserwriter IIG, which is roughly 20% faster than the Laserwriter IIF, is based on Motorola, Inc.'s 25-MHz 68030 chip and offers 300 dot/in. resolution, 5M bytes of random-access memory and connection to Ethernet, Apple's Localtalk and serial interfaces. It will retail for $4,599.

The 20-MHz 68030-based Laserwriter IIF also offers 300 dot/in. resolution as well as 2M bytes of RAM and connection to Localtalk and serial interfaces. It will retail for $3,599. Both printers are expected to be widely available by Nov. 1.

Other products introduced at the four-day show included the following:

- Digital Equipment Corp. announced its Open Publishing Products suite, which will include a compound document editor and presentation graphics package designed to work with the Sun Microsystems, Inc. product line.
- Sony Corp. rolled out the Seps 1000, a digital studio camera. It costs less than $50,000 and includes a digital processor, a 13-in. color monitor and image acquisition software for Adobe Systems, Inc. Photoshop.
- XLI Corp. in Woburn, Mass., unveiled the Laserpix 3.0 high-resolution graphics printer controller board. It will be available immediately for IBM Personal Computer and compatible computers using an Intel Corp. 80286 or higher chip and laser printers with available video port. The price will be $1,495.
- Xyvision, Inc. announced the integration of Interleaf TPS software into its Authoring and Document Management System.

Drawing tools come into focus for Windows

BY CAROL HILDEBRAND
CW STAFF

Software vendors sketched a clearer picture of the Windows drawing software market with a batch of announcements last week.

The market in the DOS and Apple Computer, Inc. Macintosh arena is saturated with such dominant players as Adobe Systems, Inc.'s Illustrator and Aldus Corp.'s Freehand, but analysts said that the Windows drawing market is just now kicking in. The biggest package currently in play is Corel, Inc.'s Corel Draw.

Chief among the announcements was Software Publishing Corp.'s unveiling of Harvard Draw for Windows at the Seybold Computer Publishing Conference & Exposition on Wednesday.

Analysts said that Harvard Draw, although an easy-to-use program packing a lot of power, is not in the same class as Corel Draw. According to Tim Bajarin at Creative Strategies Research International, Inc., "It's not as high end as Corel, but I think that SPC is positioning it as more mainstream."

Harvard Draw allows what-you-see-is-what-you-get text entry, and users can work directly in Preview mode rather than working in outline and viewing changes in Preview. A font-styling tool lets users shape text in a curve, and the color palette basically lets a user mix his own colors. The package costs $595.

Micrografx, Inc. pushed the competition with a more stripped-down drawing package for only $149. Windows Draw lacks such features as a wire frame working view and has fewer fonts, but the price is hard to beat, analysts said.

Aldus chimed in with a Windows version of its own, bringing its popular Freehand drawing and illustration package over to the hot new environment.

With the drawing software market currently at about $100 million, analysts predicted the 15% segment held by Windows applications could balloon to a sizable chunk as Microsoft's environment works its way into heavy use.

OCTOBER 1991

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16 *Atlanta, GA*	17 *Richmond, VA*	18	19
20	21	22 *Baltimore, MD*	23	24	25	26
27	28	29	30 *Cleveland, OH*	31		

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*Source: *Computerworld* article, February 1991

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INTEROPERABILITY:
CORNERSTONE OF OPEN SYSTEMS

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Interoperability: Cornerstone of Open Systems

INTRODUCTION

"Interoperability" and "open systems" are terms commonly and loosely used in conversations about computing. These terms slip smoothly off the tongues of both vendors and users alike. Vendors like to say their systems are interoperable, or better yet, open. Users say they want to be interoperable and open, but don't believe it will happen soon.

When all the talking is done, however, the emergence of open systems is dependent on a new generation of sophisticated users seeking solutions to their application requirements. This new generation of users has wrested control of computing away from the vendors who controlled the industry during the 1960s and 1970s. And they intend to maintain it. The 3.5 billion users expected to be on-line worldwide by 2000 will have the power to build open systems that conform to their needs.

The new user predominance will be vastly diluted, however, if users fail to control the changes reshaping the IT industry. And in this endeavor, they must enlist the services of vendors, for there can be no effective control of growth without an innovative stream of new tools. It is also necessary to integrate these new tools into existing systems with minimal disruption.

Unix will play a prominent — but not paramount — role in the world of interoperability and open systems. Designed with microprocessor-based systems in mind, and familiar to a high percentage of students, it will continue to play its role as a locus of innovation.

Just how soon interoperability gives way to open systems remains to be seen. Given tools such as networks, computer-aided software engineering and systems management, that day is approaching more quickly than ever.

INTEROPERABILITY: CORNERSTONE OF OPEN SYSTEMS

AT THE SIMPLEST LEVEL, IT MEANS VASTLY IMPROVED RESOURCE SHARING. AT A GRANDER LEVEL, IT MEANS INVESTMENT PROTECTION. AT THE GRANDEST LEVEL, IT MEANS ENABLING NEW WORK STYLES. ■ "IT" COULD BE OPEN SYSTEMS. OPEN SYSTEMS MAKE CONCEPTUAL SENSE. BUT REALITY INTERVENES. OPEN SYSTEMS, LIKE THE DREAMED-OF HIGH-SPEED TRAINS THAT LEVITATE ABOVE TRACKS BUILT WITH HIGH-TEMPERATURE SUPERCONDUCTORS, REMAIN ON THE PERIPHERY OF POSSIBILITY. ■ INSTEAD, "IT" IS INTEROPERABILITY. WHEREAS THE GRANDIOSITY OF OPEN SYSTEMS IS DAUNTING, THE PRACTICALITY OF INTEROPERABILITY INVITES ACTION. FASTER TRAINS ARE EASIER TO COST-JUSTIFY, SIMPLER TO BUILD AND MORE CERTAIN TO BE INCORPORATED INTO SOCIETY IF THEY RUN ON EXISTING TRACKS. OTHERWISE, ENTIRE NEIGHBORHOODS MUST BE LEVELED. ■ THE DIFFERENCES BETWEEN INTEROPERABILITY AND OPEN SYSTEMS ARE SUBTLE. THE TECHNOLOGY OF INTEROPERABLE SYSTEMS

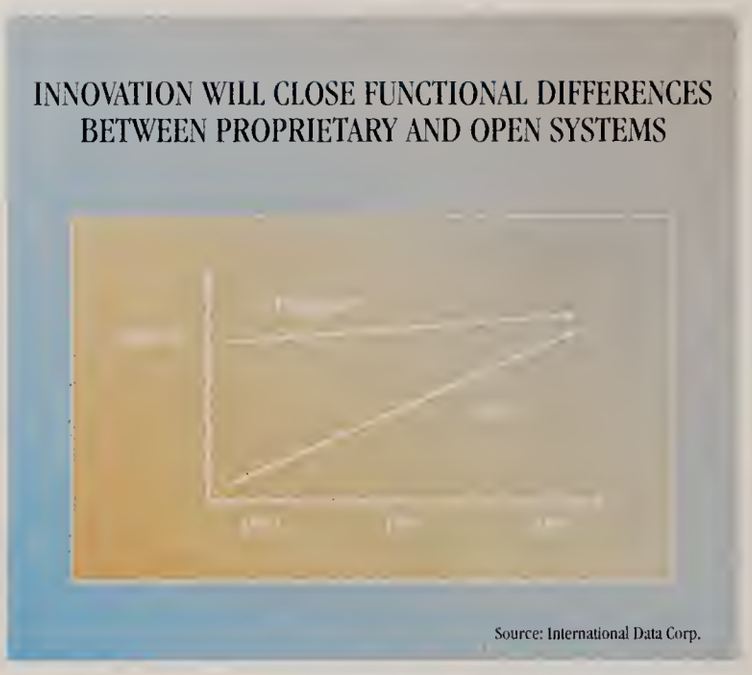
THE BIG PICTURE IN O

P E N S Y S T E M S

HITACHI

allows them to communicate across previously incompatible aggregations of hardware and software with a minimum of human intervention, usually in the form of specialized tools placed at network junctures. The value of open systems technology is found both in its availability and its diversity. Its availability allows it to interoperate across a wide spectrum of systems, while its diversity gives it unlimited ability to service new and innovative applications.

New technologies offer the potential to increase productivity. But existing technologies are essential to completing work that needs to be done now. "Out with the old and in with the new" might be a reasonable strategy in some cases, but not in the case of information systems. Needed at once are strategies that increase the utilization of existing resources and also facilitate the adoption of more productive technologies. Succinctly stated, the new must be made to interoperate with the old.



As users apply their ingenuity to their IT systems, the results will eventually spread across a wide range of user systems, making them truly open.

This does not mean that interoperability and open systems are incompatible goals. The pursuit of interoperability generally leads further down the path toward open systems. And it is likely that, when open systems are finally realized, they will be built largely on a foundation of interoperability.

Interoperability requires planning, commitment, resources, and, like most changes, involves risks. But a reasonable interoperability strategy that does not engender huge disruptions can improve the productivity of existing information technology (IT) investments. It can also enable new application forms and ultimately pollinate mature or budding information systems with new technologies.

The computer industry is going through a painful but necessary transition. Four factors are driving this transition:

- an increasingly large number of users
- increased user sophistication
- new software standards that are creating the potential for an explosion in application innovation
- new modes of processing, characterized by their close integration with user firms, i.e. airlines reservation systems.

THE CRUX OF OPEN SYSTEMS

What constitutes an "open system" is one of the most controversial topics in the computer industry. Yet upon close inspection, many opinions that on the surface seem so different have much in common.

Some claim that open systems are synonymous with Unix; that the presence of Unix is a necessary and sufficient condition of open systems. Thus, in their view, all Unix hardware, software, communications, applications, vendors, etc., are open. Anything not Unix is not open, and therefore, is bad. The implied message is, "Throw it all away and start from scratch."

Others believe that open systems are a dream; that the open systems market will never be able to completely match the portfolio of tried-and-true technologies available from proprietary vendors. Specifically, they maintain that Unix is unable to supplant other entrenched operating systems such as MS-DOS and MVS. This view, however, is less a criticism of open systems and more a reflection of bias against Unix.

As is the case in almost all disagreements where passions play, both sides are somewhat correct. Certainly it is hard to imagine open systems without Unix. It is also hard to imagine open systems built on Unix only. What seems most likely to happen is that users will find intelligent ways to employ non-Unix technologies in their installed systems.

One way to gauge the importance of Unix in today's computing world is by assessing its size in the overall IT market. IDC believes that the current asset value of all equipment, software and expertise in the U.S. alone is more than $500 billion dollars. In this accounting, expertise is defined as staffing costs and dollars spent on third-party services. Just looking at the slice of the asset pie accounted for by operating systems, Unix constitutes only 10% of the $193 billion segment. This illustrates that open systems will embody more than just Unix. If they didn't, some $180 billion worth of equipment could become obsolete.

In IDC's view, the crux of open systems is the newfound ability of users to choose the right technologies to solve their application requirements. Open systems are not about products being sold, or standards being published, or volumes being distributed. Open systems are about choice: customer choice. In IDC's opinion, open systems are things to be built — and customers are the builders.

Ten years ago, much of the industry's expertise was on the supply side in the hands of vendors. These vendors were able to regulate rates of innovation. In this regulated environment, product cycles were long and generally stable.

Back then, users were much less knowledgeable about computer technology and how it would be employed. As a result, they followed vendor delivery schedules. When their supplier said, "New stuff; much better; time to buy;" customers did.

A lot of the mystery has been taken out of computers in the last 10 years as the possibility of open systems became more realistic. Not only have customers gotten smarter about technology, they have become far more knowledgeable than their suppliers about how technology is, and should be, harnessed in their company.

This has led to a situation where, for

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The real goal is to liberate information that's trapped around your company, so more of your people can use it more easily, and to open commu-

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good, but not everyone agrees how to get there.

nications with customers and suppliers, who no doubt planned their systems without thinking about yours.

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the first time, users are the strongest force in the computer industry. Emboldened and enlightened, they are leveraging their power as they shop for technology. From this position of strength they are demanding three things:

- control over their information systems now and in the future
- facile technology transfer
- protection of existing information/technology assets.

IDC has developed the "Open Systems Cube" to depict the relationships among these goals.

On the Y-axis we place the degree of customer control. As customers gain control over their systems, they are in a better position to maintain system availability and lower their reliance on individual suppliers for new technologies. In this environment, portability and scalability are essential to increasing customer control.

On the X-axis we place facile technology transfer. The easier it is for the information system to adopt new technologies, the more open the information system.

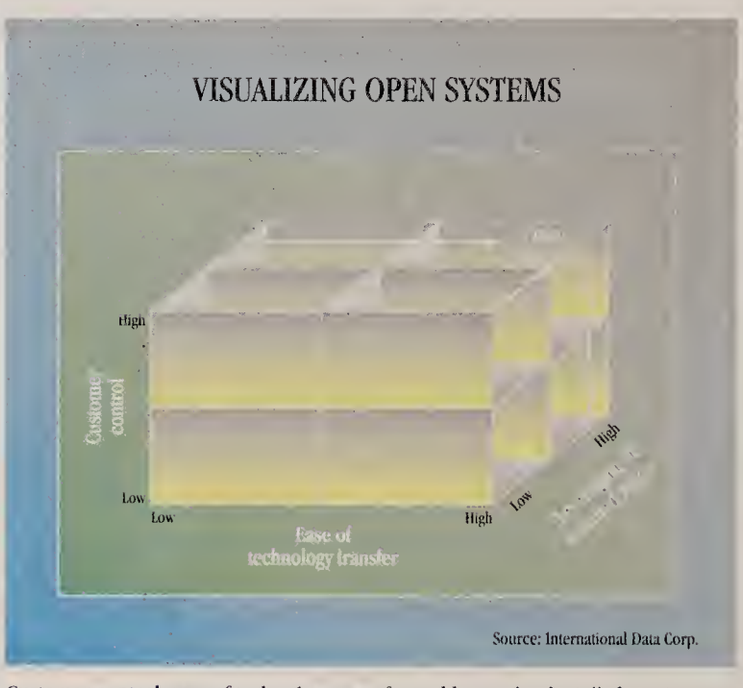
On the Z-axis of the Open Systems Cube is the third — and too often discounted — aspect of open systems: the degree to which the system affects existing assets. Introducing new technologies into an existing system is made especially difficult if, in the process, large portions of old technologies must be replaced. The issue is not trading device for device, e.g. a color terminal for a black and white terminal, but replacing expensive support hardware and software, such as controllers, system software or entire CPUs. A system is more open if productivity enhancements are not solely limited to the introduction of new devices at the expense of old, but also derive from enhancements to existing equipment as well.

The three goals of open systems — control over information systems, facile technology transfer and the protection of current IT assets — are not necessarily mutually supportive. Serious tradeoffs are present. For instance, customer control implies stability in the system, whereas low-adoption barriers imply flexibility and ease of change. Moreover, a customer's ability to make changes may be constrained by the existence of mature installed technologies. In the real world, customers are wedded to certain suppliers. Does that mean that users should throw up their hands and be dominated by the status quo? Of course not. What it means is users must pressure their installed vendors to deliver new, more productive tools.

There is another critical issue related to interoperability and open systems. With increasing frequency, users want to create larger, more complex information systems from smaller, easier to maintain, and in many cases already stable ones. This trend is an example of users turning to interoperability as a means of increasing complexity while maintaining control.

Interoperability is different from open systems in one critical way: it is within reach while open systems remains elusive. Like open systems, however, interoperability must, and does, address control over information systems, facile technology transfer and the protection of existing IT assets.

Interoperability increases customer control by increasing the pool of available technology options. It does not, however, require portability, scalability and other more restrictive measures. All that is necessary is that systems can be combined when, and as, needed.



Customer control, ease of technology transfer and leveraging installed assets must all be heightened in the quest for open systems.

Interoperability aids facile technology transfer and abets lower technology adoption barriers through its dependence on standards.

Interoperability helps users exploit their existing base of assets by being open to the development of new technologies that are compatible with installed systems. To this end, IBM is laboring to improve its S/370 support for a range of technologies from the mundane, like TCP/IP, to the marvelous, like Open Systems Interconnection.

COMPONENTS OF INTEROPERABILITY

Interoperable systems are composed of several contributing elements and characteristics. They include:

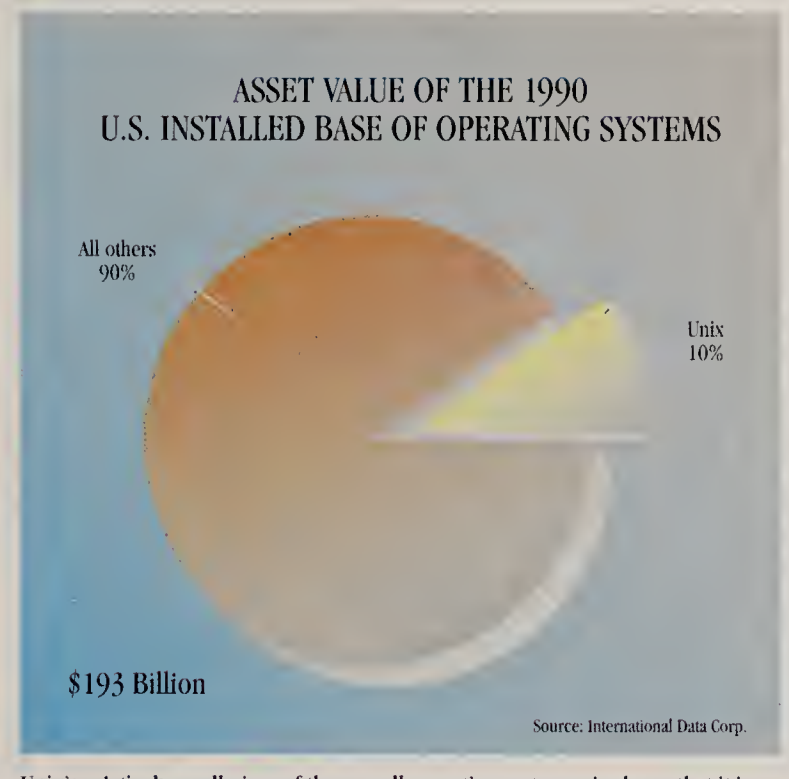
Networks. To interoperate, autonomous systems need some sort of network to pass messages, data and control. The network serves two purposes. First, it provides the means by which systems communicate and synchronize work. Second, it enforces security measures, ensuring that integrity problems in one system do not corrupt another. The more complex the interconnection, the more the network must facilitate communication. And, the more functional the network, the more interoperable its systems.

Heterogeneous interconnection. Interoperability usually implies the aggregation of IT resources from numerous suppliers into a single coherent system. Of course, this is not always the case; sometimes getting IT deliverables from an individual supplier to work together is often challenging by itself.

Standards. Heterogeneous interconnection and networking are easiest where standards are in place. And by standards IDC does not solely mean "things that are manufactured in volume" or "industry driven," but rather functional, stable, and well documented principles of operation. Given users' increased sophistication and the proliferation of standards, users now have the option of choosing the standards that will help them the most. Some of the most important standards are data languages

such as SQL and networking standards like OSI or OSF's DCE. Equally important are common user interfaces, especially graphical user interfaces, which make hardware components, program tools and overall systems look similar. These interfaces raise interoperability above the machine-to-machine level.

It is not important that all standards come from sources outside user organizations. Users both large and small are independently establishing interoperability standards to support their own processing needs. It may not be as inexpensive as adopting commercially available standards, but some situations require more specialized function, but no less stable definition. What is important is that standards, whether commercial or proprietary, evolve to support an information system's ongoing requirements.



Unix's relatively small piece of the overall operating systems pie shows that it is not the ultimate key to open systems.

Flexibility. Interoperable systems are not in constant contact with each other. Given the costs of network bandwidth, it is most desirable that they employ network resources only when necessary. The only time interoperating systems need to be synchronized is during transaction processing. The rest of the time they can be dedicated to other work.

Control. If there is one issue that cannot be stressed enough, it is the importance of control. Because of their dynamic nature, interoperable systems require special attention. Security must be enforced to maintain integrity not only of the combined entity, but of each autonomous system as well. Even more importantly, the personnel and procedures employed to control interoperable systems must be flexible enough to accommodate abnormal periods of interoperation.

Management. Interoperability is not a product, or an architecture. Like open systems, interoperability is what the customer makes it. As with open systems, a principal tenet of interoperability is choice — deciding which technologies to buy at which price, and from whom. But with greater choice comes greater responsibility.

IT suppliers today have only begun supplying highly-functional interoperability in their products. Few are selling anything like "shrink-wrapped" integration. If users want more than intermediate levels of interoperability, they either have to take control of customized integration themselves or be willing to pay someone to customize their systems. If they do it themselves, they must underwrite the risks. Many feel these risks are ultimately less costly than choosing a vendor solution.

Risk and uncertainty, however, have always been present in the IT industry. They have not, however, been unsurpassable barriers. As users overcome them, they become increasingly computer-literate and bolder in their exploration of application possibilities. This aggressive spirit has had a strong impact on the industry.

For example, the tremendous demand for Lotus 1-2-3 during the mid-1980's was instrumental in driving the market for DOS-based personal computers. Indeed, 1-2-3 became so widely installed that it was jokingly suggested that not only was it the number one spreadsheet package, but also the number one word processing package as well. Not satisfied to do only spreadsheets, curious and persistent users successfully transformed 1-2-3 into something it was not originally intended to be.

The case of 1-2-3 is illustrative of the user-level innovation that is a major attribute of interoperability.

The challenge of providing users with the power to innovate and interoperate is substantial. Single-user stations defined by physical proximity are far simpler to conceptualize, build and manage than multi-user stations defined logically by the limits of networks. These single-user stations are also, however, far less powerful, which does not endear them to corporate computing environments.

Given the demands for more sophisticated capabilities, the goal is to provide users with access to complex tools, but make it easy for them to use those tools. This means IS departments must provide user-friendly access to databases, networks and backbone applications.

Thus, interoperability implies a strengthening of partnerships between IS departments and end users, between vendors and customers, and between manufacturers and independent resellers.

The innovative environment engendered by interoperability feeds on itself at both the user and vendor levels. As users interoperate locally and globally, they increase their expertise by sharing their experiences. Vendors benefit by borrowing and trading technologies developed by their customers.

THE ROLE OF UNIX

The operating system technology that has best exploited the phenomenal price/performance improvements in microprocessors while remaining inexpensive and easily accessible is, of course, Unix. Thus, as customers large and small have shopped for IT solutions with the best price/performance tools to support the building of relatively well understood and stable types of shared-resource work systems, they have turned to the potent combination of microprocessor-based systems and Unix.

The simplified and standard technology interfaces associated with Unix not only lower technology-transfer barriers, but also greatly improve partnering possibilities.

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Unix technology developed by one source is easier to license or purchase because the cost of integrating the various technologies is lower. On the hardware side, this opens the door, for example, to deals between chip manufacturers and hardware vendors or disk drive and controller makers. Additionally, vendors in the Unix realm are developing more experience with these types of arrangements than most vendors focused on proprietary product sets. These companies will find it easier to develop and administer increasingly complex combinations of technology and marketing partnerships.

As the growth of hardware technologies such as desktop computers levels off, innovative software applications begin to proliferate.

Perhaps no type of partnerships are more important in the computer industry than the partnerships forged between hardware vendors and independent software vendors (ISVs). Unix offers software vendors the opportunity to leverage development investments across numerous Unix environments because of lower technology-transfer costs. As a result, ISVs can afford to enter into more partnerships than they could in the proprietary world. Similarly, Unix systems vendors will find it easier to recruit ISVs because of the lower software-porting costs of Unix.

The final supply force driving Unix growth is the availability of relatively inexpensive, yet high-quality, Unix expertise. Because Unix is the language of learning in so many computer education programs, the best and most up-to-date computer industry labor pool contains many former Unix students. Unix minimizes the amount of proprietary technical training required to make these potential new employees productive, and, because of their relative youth, minimizes the salaries necessary for them.

On the demand side, the lower development costs incurred by Unix vendors are channeled to users in the form of lower prices. Although this sounds good, in the case of certain markets, it is important to note that these inexpensive but relatively young solutions may embody more risk than more stable, proprietary offerings.

Just as the benefits of lowered technology-transfer barriers accrue to vendors in the Unix market, users also realize significant benefits from standardized Unix technologies. The costs of moving from one Unix vendor to another are significantly less than those incurred while moving among proprietary vendors.

This is especially important in a market characterized by an ever-expanding portfolio of application packages. Just as Unix makes it easier for ISVs to develop and market new applications, it also greatly simplifies user access to these new applications.

The lower technology-transfer barriers associated with Unix make it easier for users to adopt various related technologies. The expense and risk of integrating new Unix technologies into installed Unix systems is lower than that for most proprietary systems. And once Unix systems are installed and stable, they can be expanded with minimal disruption.

New classes of Unix-based solutions that offer expanded function at no more risk than proprietary systems are emerging. The frantic pace of innovation and the relative ease of transferring innovation among Unix platforms is rapidly closing the "function gap" between Unix solutions and all but the most fine-tuned proprietary solutions.

Even in the most monolithic and proprietary environments, such as IBM's MVS/ESA, suppliers are laboring to incorporate Unix interoperability. In the past few years, IBM has delivered support for Unix-oriented technologies such as TCP/IP, X-Windows and NFS within MVS.

Still, in many proprietary environments Unix interoperability remains expensive. Users who simultaneously want to experiment with interoperability while using stable, proven technologies to perform critical work should strongly consider turning to Unix. Because many interoperability tools such as TCP/IP and NFS are both inexpensive and highly functional on Unix platforms, they are a reasonably safe investment.

It should also be noted that users, like vendors, benefit from access to the pool of former students.

THE FUTURE OF INTEROPERABILITY

Understanding the future of interoperability requires attention to two issues. The first is the rate of innovation in tools that support interoperability. The second is the way staff and expertise must be deployed in interoperable environments.

Not all the tools required for simple, heterogeneous and highly-functional interoperability are available today, let alone widely installed. Innovation must deliver new tools and enhance existing tools to keep from losing large segments of the installed base.

Three classes of tools are most important to the evolution of interoperability: networks, computer-aided software engineering (CASE) and systems management.

The networking entity gaining most popularity in interoperability environments is the client/server model. The client/server model borrows heavily from widely installed software technologies such as transaction monitors and LAN operating systems. In the client/server environment, the rush is to integrate the best of these relatively stable technologies and generalize the result in the form of standards.

Widespread adoption of CASE technologies is required to facilitate the transfer of application technology and provide a credible foundation for interoperable applications. CASE enables the sharing,

coordinating and documenting of application resources. With CASE, users and suppliers can at once increase program complexity, shorten development times and make vast strides in software quality.

The issue of software quality is especially important. As hardware platforms are connected into interoperable systems, shared software resources become critical to system availability.

Greatly improved systems management programs will mask increased application complexity from users and place far better tools for controlling complex information systems into the hands of information systems management.

The convergence of supplier and buyer forces is driving Unix market growth.

Enhanced networking, CASE and systems management are all required to lighten demands on personnel. People can not be expected to keep up with highly dynamic interoperating information systems. For instance, it is impossible to imagine a management team keeping constant vigil over network changes that last milliseconds. Only computers can operate at such speeds, and only computers will be able to manage themselves.

The second issue relating to the future of interoperability is organizational management. Even though new systems management technologies will simplify the demands interoperability places on staff and support resources, the way staff and expertise generally are deployed must be adjusted.

Not surprisingly, the primary pressure points are the points of system interconnection. Consoles must be consolidated, data elements must be mapped to each other and application logic must be made consistent. These organizational issues affect much more than just the network management group. Operations, application development and storage management staffs will have to learn new tools and procedures. The good news, however, is that all these new skills are transferable.

The rate of interoperability adoption will be greatly impacted by what IDC calls the network externalities of interoperable computing. Interoperability is a phenomenon that will feed on itself. The initial investment in interoperable infrastructures will be expensive. However, after these initial investments are made, the average costs of interoperable applications will drop precipitously. This is because users will be able to continually leverage early software investments.

The economies of interoperability are thus similar to those of other network-oriented technologies such as telephony. The 400,000th subscriber to the telephone network may have to pay the same entry costs as the 400th subscriber, but he or she is able to call 399,999 other subscribers instead of only 399. It is this network externality that will be critical to the rate of growth in the interoperability market.

As specialization migrates from IS to departments to users, less control creates more freedom to innovate.

CONCLUSION

In the computer industry, specialization and diversity are constrained by limits on the quality and costs of our tools, and our inability to use them to build coherent and consistently-behaving information systems.

There is no such thing as a computer technology that is appropriate for all problems. The complexity of the computer community requires specialization and diversity. Today, users can shop knowledgeably for the best alternatives. They are engaged in the innovation process that spawns new tools.

Strategies for ensuring that these tools interoperate with each other, and with those already in use, are required. New perspectives about procurement priorities, resource allocation and sources of value are also needed. In addition, new patterns of management must be developed and incorporated in future automated management tools.

Beware the comprehensive open systems plan. The open systems market is very immature and unproven. Someday open systems will become a pillar of the computer industry. Rather than wait passively for that day, it makes good sense to reach for interoperability.

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Security, controllability on PC Dynamics menu

BY CHRISTOPHER LINDQUIST
CW STAFF

A consistent user interface, extensive security features and ease of use and maintenance are what PC Dynamics, Inc. claims to offer in its recently announced Menuworks Total Security, a DOS-based menuing system.

The package lets administrators control personal computer access by allowing them to do such things as design menus, assign passwords, set security levels for a variety of DOS functions, encrypt disks and log system use. Users can also be prevented from rebooting a machine, shelling to a DOS command line in applications, booting from a floppy and accessing restricted files. The product will identify more than 2,500 applications and install them into menu categories. It also includes rudimentary virus protection.

"It's about time somebody thought of security," said Mike Soto, data center manager at Credit Card Services Corp. in Springfield, Va. Soto had been looking for a security package for his networked workstations, which can contain confidential credit information, when he became a beta-test user of Menuworks Total Security. "I'm really pleased with the product," he said.

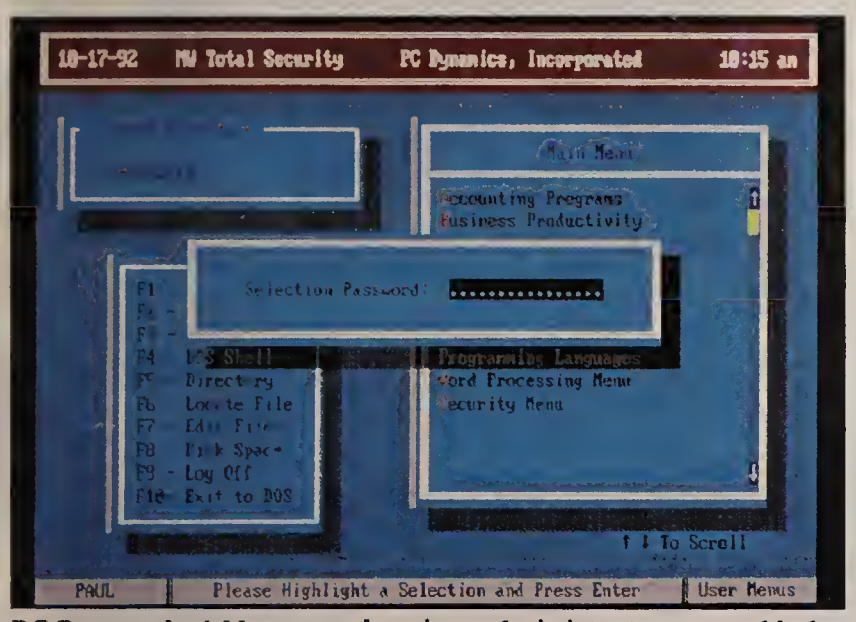
Lloyd Chesney, chief information officer at the Palm Beach County Health Care District in Florida, has also been beta-testing Menuworks Total Security and said he has been very impressed with its solidity.

"I wanted to have a consistent user interface regardless of whatever interface they may be used to to access the networks," Chesney said. He was also enthusiastic about the security features of the product. "I can lock that menu up so tight that no one can change anything."

When asked why he chose a menuing interface over one of the graphical user interfaces becoming so prevalent, Chesney replied, "If you've ever worked with a lot of the graphical user interfaces, a user can tear up stuff that you've never even dreamed of — by accident."

Chesney added that he plans to set up several hundred users with Menuworks Total Security in the near future.

The suggested retail price is $149.95. Site licenses are also available.



PC Dynamics' Menuworks *gives administrators control by letting them build menus and assign passwords*

GIS eases redistricting worry

Computing power helps Justice Department watch for discrimination

ON SITE

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — For the first few years of every decade, the Civil Rights Division at the U.S. Department of Justice sees a huge spike in its work load as redistricting plans pour in from states claiming that population shifts revealed in the decennial census justify new voting districts.

Now, for the first time, the agency is tapping computer power to help it fulfill its legal mandate of ensuring that the proposed election districts are not drawn so as to disadvantage minority groups or to favor the party in power.

Previously, Justice Department analysts would roll out carpet-size maps and overlay them with huge color-coded acetate sheets on which they would mark the proposed district boundaries. With handheld calculators, they tallied population figures by race from a thick printed report and posted the results onto the acetate sheets.

Then the real work began, trying to determine if districts contained equal populations to ensure equal representation in Congress and to see if boundaries were gerrymandered — drawn to favor or disadvantage local ethnic or racial constituencies.

"It was a very tedious, error-prone and laborious exercise that no one enjoyed," said Robert K. Bratt, executive director of the Civil Rights Division.

Now analysts sit at Sun Microsystems, Inc. workstations and use geographic information system (GIS) software from Environmental Systems Research Institute, Inc. to perform the same functions much faster and more accurately. The GIS package, called Arc/Info, allows users to draw district boundaries with a mouse onto color map images on the screen. The system then computes and displays for any selected area population counts and percentages by race.

Data gold mine

The GIS draws data from a 327G-byte database of census and geographic data stored in a Qstar Technologies, Inc. write-once read-many optical jukebox attached to the local-area network. Population data by race is available down to the street and block level for the entire U.S. The census data and the digitized maps are publicly available from the U.S. Bureau of the Census.

Using menus, analysts can select different levels, including counties, precincts and blocks. They evaluate the redistricting plan as submitted, often comparing it with earlier district boundaries, then they move lines to test the effects of alternate schemes. Maps and statistical reports that reveal problems can be printed on demand and sent back to the jurisdiction submitting the plan for another try within 60 days.

Analysts and lawyers use the system as a tool to buttress their intuition, and areas with more than certain percentages of minority populations — highlighted by color — get special scrutiny. "If you see a line drawn right through the middle of a minority area, so that the vote is split, that might set off alarm bells," said Nancy Sweesy, contracting officer/technical representative for the system.

The system was set up by Sylvest Management Systems in Lanham, Md., under a five-year, $4.9 million contract. According to Bratt, analyses that used to take hours can now be done in minutes. The labor savings, he said, are estimated to produce a 171% return on the $4.9 million investment over the five-year period.

Voting jurisdictions are increasingly using their own automated systems to support redistricting, using subsets of the Census Bureau's geographic and population data, Bratt said. That allows them to send in their plans on tapes or disks, bypassing the mouse input of boundaries at the Justice Department.

But sometimes the plans — which Bratt said are occasionally submitted on "gas-station maps" — require careful scrutiny and some interpretation. One plan, from a Louisiana city, was submitted in the form of a map that looked as though it had previously served as a restaurant place mat, with advertisements for various local establishments printed around the edge. "Sometimes we have to go back to the jurisdiction for more information," Sweesy said.

Remapping and recounting

Computers should make the arduous task of redistricting less cumbersome and more accurate

U.S. Department of Justice Civil Rights Division combines . . .

- 1,200 redistricting plans a year from 17 states, most filed as paper maps.
- 327G bytes of census and geographic data from the U.S. Bureau of the Census.

And produces as output . . .

- Color maps displayed on screens or printed showing state redistricting plans overlaid with demographic data from the census.
- Reports analyzing the plans' impact on voting strength of minority groups.

Using . . .

- Geographic information system software for plan analysis and map production.
- 46 Sun Sparcstations and a Sun 4/470 file server on an Ethernet LAN running Sun's Network File System.
- 8 black-and-white printers, 4 color printers and 2 electrostatic color plotters.
- A Qstar Technologies write-once, read-many optical jukebox.

CW Chart: Janell Genovese

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xdb XDB Systems, Inc.

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Berst

FROM PAGE 41

mation at your fingertips" (a la Bill Gates), the road to the GUI future runs through the IS department.

Douglas Drumheller provides a perfect example. Drumheller, manager of process information technology at the Westinghouse Productivity and Quality Center in Pittsburgh, is in the middle of a three-year computing plan.

In the first year (1990), Drumheller put the infrastructure into place — the networking standards, the hardware standards and the graphical user interface standard (Microsoft's Windows).

In the second year (1991), his group is rolling out personal productivity tools for that standards platform, including products such as Excel and Word for Windows from Microsoft.

But it's in the third year (1992) that Drumheller's strategy will begin to pay off big-time. That's when his people will marry the Windows products to Westinghouse's internal business and marketing systems.

Using Visual Basic and macro languages, they will create custom versions of off-the-shelf software. And they will link those custom versions to Westinghouse's existing corporate data.

All this work and support is being accomplished for 125 users by a group of just four people — and it's being done without any heavy-duty C or Cobol programming. Now that's the future of the GUI.

It was the IS group that spearheaded the Westinghouse plan. Likewise, in almost every corporation, it will require the leadership of the IS department to use a GUI to accomplish certain goals:

- Putting a user-friendly face on existing mainframe and minicomputer applications.
- Downsizing existing applications.
- Linking existing workstations.
- Reducing support costs through companywide standards.
- Making corporate data easily accessible to anyone who needs it.

The GUI is going to revolutionize corporate computing. And, whether you realize it or not, IS professionals have been drafted to serve on the front lines.

So stick out your chest. Pat yourself on the back. Thanks to Windows and Presentation Manager, you're more important than ever before.

Berst is the publisher of "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Qualitas upgrades memory products

BY CHRISTOPHER LINDQUIST
CW STAFF

Qualitas, Inc. has announced upgraded versions of its 386Max and Bluemax memory management software products.

The products — Bluemax for IBM Personal System/2s and 386Max for other Intel Corp. 80386- and I486-based systems — increase available application memory by allowing memory-resident programs to be loaded into high memory, similar to what can be done with MS-DOS 5.0. However, the Qualitas products offer other features not found in MS-DOS, including the following:

- ROMsearch, which can recover memory previously used by read-only memory (ROM) software.
- VGAswap, which allows video ROM software to be relocated, freeing memory.
- Automatic Program Reordering, which allows resident programs to be rearranged in memory to produce optimal memory use.
- A new integrated interface for installing and configuring the products.

386Max is available for a suggested retail price of $99.95. Bluemax has a suggested list price of $124.95.

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Keyfile unlocks potential of LAN-based imaging

BY ELLIS BOOKER
CW STAFF

NASHUA, N.H. — Keyfile Corp., a start-up based here, last week introduced a low-priced image and text management system that heralds an emerging market of shrink-wrapped imaging packages for local-area networks, according to observers.

"It's the first product with what I would call comprehensive desktop," said Peter Saneusanio, president of Xionics, Inc., an Orange, Calif.-based maker of accelerator boards for personal computer imaging.

Up to now, document imaging has largely been a fixed application, deployed for specific tasks such as processing insurance claims forms.

But in reality, Saneusanio said, the great opportunity for imaging is ad hoc work — those unstructured tasks of white-collar professionals.

Keyfile's namesake software is built with this sort of worker in mind. For example, a user can scan an article from a trade journal, store a personal copy, send another version to a common mailbox on the LAN and fax copies to three other colleagues on a distribution list — all without moving from the keyboard.

"There are several companies trying to deliver similar products ... These guys are first," said Paul Zagaeski, a senior analyst at The Yankee Group in Boston.

"If you wanted to provide LAN-based faxing and add to that OCR services and then add to that a work flow, you're not talking about a whole lot of money," he said.

A major piece of the Keyfile software — the company's first since it formed in March 1989 — is its built-in work-flow tool. So-called work-flow systems manage the routing and distribution of images, text and graphics to users on the LAN.

Warren Zafrin, assistant vice president at the chief technology office of Citibank and a beta-test user since June, praised the system's graphical user interface in particular. "It's been designed with the user in mind," he said, adding that the program comes with a basic work-flow application built in that should be a boon for nontechnical users.

> "IT'S THE FIRST product with what I would call comprehensive desktop."
>
> PETER SANEUSANIO
> XIONICS

Zafrin said he hopes to roll out a network of approximately 30 information systems users once a LAN for this purpose is in place.

The Keyfile Desktop features intelligent, object-oriented icons that can be configured by the user. The icons can execute a single command — such as sending an image file between two users or running a scanned document through optical character recognition (OCR) software — or initiate a sequence of actions.

Users "program" these sequences by dropping action icons into the desktop's Keyfiler icon.

The package is also notable for its support of both Microsoft Corp.'s Windows 3.0 and IBM's OS/2.

On each desktop, users need Keyfile's $995 Keyfile Desktop software, which requires at least an Intel Corp. 80286-class PC with a minimum of 4M bytes of random-access memory (6M to 8M bytes is recommended) running under Windows 3.0.

The Windows-based LAN server software (for work groups of up to eight users) costs $1,955; the server software under IBM's OS/2 Extended Edition for larger LANs costs $4,995 and requires the client workstations to be 80386-class or better PCs running OS/2 Version 1.2 or higher and Presentation Manager.

This is the one after that.

And because the disk controllers, I/O interface, and VGA ports are built into the mainboard, there are 7 expansion slots available.

Of the 4 drive bays, 3 are accessible from the front of the computer. And the system has 2 serial ports and one parallel port. All in a compact slimline case.

In other words, The Tandon Option is a system that offers you all the technology of today, and the option of all the technology of tomorrow.

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Charisma 2.1: Improved speed, ease of use

Technology Analysis — A round-up of expert opinions about new products. Summaries written by New Products Writer Derek Slater and Intern Lisa Davidson.

Micrografx, Inc.'s latest offering of Charisma, Version 2.1, includes Microsoft Corp. Windows 3.0 support and enhancements to an already rich selection of presentation capabilities.

Ease of use: The Windows interface makes the commands more intuitive and combines with a signficant speed improvement to make Charisma 2.1 easier to use than its predecessor.

Charts: The program is weak in some aspects of text charting. For example, Charisma 2.1 lacks some organization-chart features, according to *Infoworld*. Numeric charting, however, ranked among the best.

Graphics: Charisma 2.1 offers more than 2,200 pieces of clip art. Version 2.1 also includes an import option for Wordperfect Corp.'s Drawperfect WPG files.

Tools: Charisma 2.1 provides a wide array of drawing tools. Users can use rectangles, lines, rounded rectangles, freehand shapes, ellipses, curves or parabolas.

Value: At $495, Charisma 2.1 provides a good selection of presentation capabilities and sound improvements in ease of use and speed.

Micrografx's Charisma 2.1

Reviews	Ease of use	Charts	Graphics	Tools	Value	Overall
PC/Computing 6/91	Intuitive menu structure	Turns out charts quickly	Generous supply of clip art	Many options	NC	Biggest improvement is speed
PC Week 6/24/91	Good	Good flexibility	Extensive drawing tools	Provides template folders	NC	Fine program
*PC Magazine** 5/14/91	Attractive output difficult	Data handling uneven	Full-featured drawing tools	Editing is fairly easy	NC	Good choice for complex charts
Users						
W. Douglas Drumheller, Westinghouse Electric Corp.	Very good	Very good	Very good	Very good	Good	Very effective product
Terry McIntosh, Chevron Corp.	Good	Very good	Very good	Very good	Very good	Wealth of charting tools
Alex Caruso, Large telecommunications company	Very good	Very good	Very good	Very good	Very good	Stunning presentation
Sal Merchant, Conner Peripherals	Very good	Very good	Very good	Very good	Very good	A little bit slow
Analysts						
Keith Thompson, Datalex Corp.	Good	Good	Very good	Very good	Good	Continued improvement
Jerry Caron, Faulkner Technical Reports	Fair	Good	Good	Very good	Good	Tremendous graphics capabilities

Key: Very good, Good, Fair, Poor. Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **PC Magazine* reviewed Version 2.01.

Vendor financial information

Micrografx reported first-quarter (ending in June 1991) net revenue of $8.4 million, compared with $5.7 million for the same period last year. Net income increased to $680,000 from $670,000. W. Christopher Mortenson at Alex. Brown & Sons rated the company's short-term performance as fair and its long-term stability as good.

Micrografx responds

Bett Cook, product marketing manager:

Charts: Our clip art has organizational charts. It's easy to develop charts with the Charisma templates and text editors. We revised Version 2.1 in June and are looking at the next feature set.

Graphics: We have a library of more than 2,200 clip art choices, extensive drawing tools and color palettes.

Persuasion: Many features but lacks DDE

Aldus' Persuasion 2.0 for Windows

Reviews	Ease of use	Charts	Graphics	Tools	Value	Overall
Infoworld 9/16/91	Good	Excellent text charts	Very good	Very good	Very good	7.5*
PC Week 6/24/91	Illogical menu arrangement	Good	Good variety of import/export	Versatile master-slide treatment	NC	Packed with features
PC Magazine 5/14/91	Complex	Standard business fare	Powerful drawing tools	Fully integrated outliner	NC	One of the most innovative
PC/Computing 6/91	Global perspective; pinpoint control	No link to original worksheets	NC	Spectacular background washes	NC	Impressive achievement
Users						
Sandi Baker, BCA Design	Fair	Fair	Good	Very good	Good	Like the outliner
Paul Grosjean, Design Spectrum, Inc.	Good	Good	Very good	Very good	Very good	Most productive
Linda Firnberg, Medical Office Connection	Very good	NC	Very good	Very good	Very good	Extremely productive
Analysts						
Keith Thompson, Datalex Corp.	Good	Good	Good	Very good	Good	Product of choice
Rich Bader, *PC Letter*	Good	Very good	Good	Good	Good	Hard to learn; great software

Key: Very good, Good, Fair, Poor. Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* ratings based on 1 to 10 scale.

Vendor financial information

Aldus, based in Seattle, reported second-quarter 1991 revenue of $44.3 million with profits of $7.6 million. For the same quarter in 1990, revenue was $33.3 million, and profits were $5.8 million. David Bayer, an analyst at Montgomery Securities, rated Aldus' short-term financial performance as good and its long-term stability as very good.

Aldus responds

Mark Sherman, product marketing manager:

Charts: DDE will definitely be addressed in a future version.

Graphics: We do have object rotation but in 90-degree increments. You'll likely see one-degree increments later.

Value: We're offering a $99 trade-up from virtually any PC presentation package through February.

Aldus Corp.'s Persuasion presentation graphics software for Microsoft Corp. Windows 3.0 is similar to its older sibling for the Apple Computer, Inc. Macintosh platform.

Ease of use: Building a presentation in Persuasion starts with an outline rather than with individual slides. Reviewers said this method takes some getting accustomed to, but the outliner is intuitively structured.

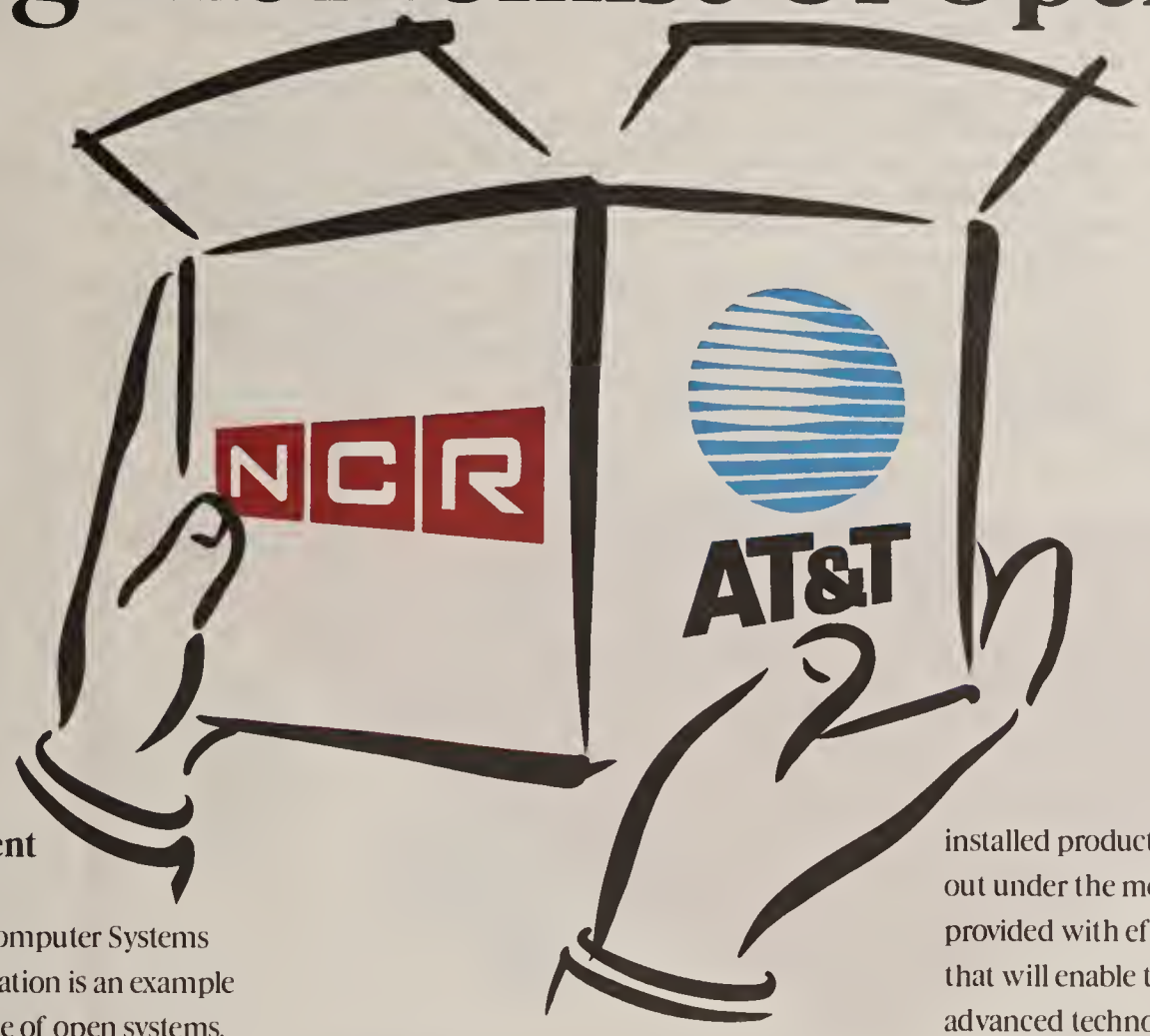
Charts: Forms for bulleted text charts and organizational charts are included, along with many number chart forms. Individual chart elements can be edited. There are no built-in calculation tools, and, more significantly, Dynamic Data Exchange is not supported.

Graphics: Editable clip art and excellent color control are pluses for Persuasion. Files in a variety of formats can be imported. Support for object rotation and some advanced curve types are missing.

Tools: The slide sorter helps organize presentations. Strong screen show transition effects such as wipes and fades are also provided. However, the package lacks a script language for building interactive presentations.

Value: Persuasion carries the standard $495 price tag and comes with Adobe Systems, Inc.'s ATM bundled in. Reviewers agreed it has an excellent set of tools for building almost any type or style of presentation.

NCR And AT&T. Delivering The Promise Of Open Systems.



A Shared Commitment To Open Systems.

The merger of AT&T Computer Systems Division with NCR Corporation is an example of the tremendous promise of open systems.

Other computer industry mergers have beeome snarled in efforts to resolve conflicts between incompatible hardware and operating systems. AT&T and NCR, unique among major eomputer eompanies, have for years been committed to delivering totally open systems. As a result, we've been able to merge our produet lines in months rather than years.

"This alliance should bring them into a market leadership position in the next 12 to 18 months. There's an unbelievable number of potential synergies between them, especially considering AT&T's expertise in telecommunications."

—Chris Christiansen, The Meta Group

From personal computers to enterprise servers far surpassing mainframes in power, to an innovative suite of enterprise integration software, to the world's most eomprehensive set of networking and eonneetivity produets, no one is delivering more eomplete, and powerful, open systems solutions.

A Merger Of Strengths.

NCR's Open, Cooperative Computing strategy has been acclaimed by analysts. And embraeed by a fast-growing number of customers. NCR brings exeeptional strengths to the merger. Worldwide sales and marketing expertise, an exeellent reputation in terminal and transaction proeessing, expert finaneial management, and demonstrated skill in designing and manufacturing innovative produets.

AT&T's eontributions to the new organization provide a remarkable synergy. Supplementing NCR's open, end-to-end eomputer family with the world's most sophistieated and complete suite of open networking produets. The strength of a $43 billion dollar international organization. And the R&D and eutting-edge teehnology resourees of AT&T Bell Labs.

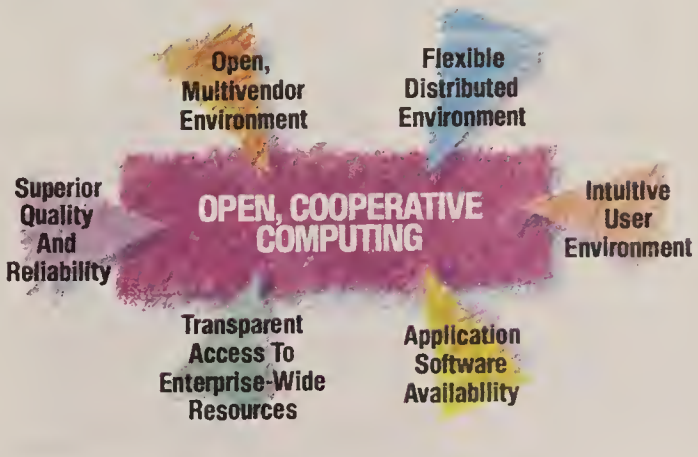
Honoring Commitments To Customers.

NCR's new strengths will be instrumental in attraeting a wide range of new eustomers. But we've also spent a great deal of time and effort ensuring that past and eurrent AT&T and NCR eustomers are well served.

All customer commitments of both organizations will be fully honored, of eourse. Customers who have eurrently installed product lines that will be phased out under the merged organization will be provided with effeetive migration strategies that will enable them to implement our advanced technology products without abandoning their current investment.

A World Leader In Open, Enterprise-Wide Information Systems.

NCR is now the Networked Computing Resouree of AT&T. With the people, the produets, and the finaneial resources to become a key foree in developing the transaetion soeiety of tomorrow.



Open, Cooperative Computing is a completely open enterprise computing strategy backed by the resources of NCR and AT&T.

Our goal is to create open, global computer networks that are as easy to use, as efficient, and as aeeessible as the telephone network is today.

NCR and AT&T. While others talk about the promise of open systems, we're delivering on it. For more information , phone 1-800-CALL NCR.

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Software smooths graphics compression

BY CHRISTOPHER LINDQUIST
CW STAFF

Transferring and storing image files can be a time-, money- and disk-consuming task.

One solution to the problem is image compression, and Iterated Systems, Inc. in Norcross, Ga., has developed a software product, the P.OEM Fractal Formatter, that allows users to take images in a variety of formats and convert them into a highly compressed Fractal Image Format (FIF), which can result in shortened transmission times and reduced storage requirements.

Compression is accomplished via a Fractal Transform Image Compression Board. Users can select any 8-bit grayscale or 24-bit color image in a supported format, such as Tag Image File Format or .BMP bit maps, and convert it to the FIF with compression ratios that have been demonstrated at up to 2,456-to-1, according to the company.

Fractal Transform compression is a "lossy" technique, meaning the compressed image is not an exact duplicate of the original. Users can influence the quality of the FIF image by choosing the final file size and level of compression to be used. Larger files and longer compression times result in more accurately reproduced images.

Another reported advantage of FIF is that it is "resolution independent." Because the original image is converted into a fractal formula, zoomed or shrunk images retain all the information of a full-size image.

The P.OEM Fractal Formatter requires Microsoft Corp.'s Windows and has a list price of $79. Fractal Transform Image Compression Boards cost $1,995 to $8,850, depending on configuration.

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PC & WORKSTATION SHORTS

NEC unveils Ultralite III

NEC Technologies, Inc. recently announced the Ultralite III, a 4.8-pound notebook computer based on a 20-MHz Intel Corp. 80386SX chip. The box has 2M bytes of random-access memory (expandable to 10M bytes), a 60M-byte hard drive and an external numeric keypad. Microsoft Corp.'s Windows 3.0 is bundled with the box, which is expected to ship this week and carries a $3,699 price tag. NEC also announced a $999 Docking Station, which weighs less than 10 pounds and has room for an external floppy.

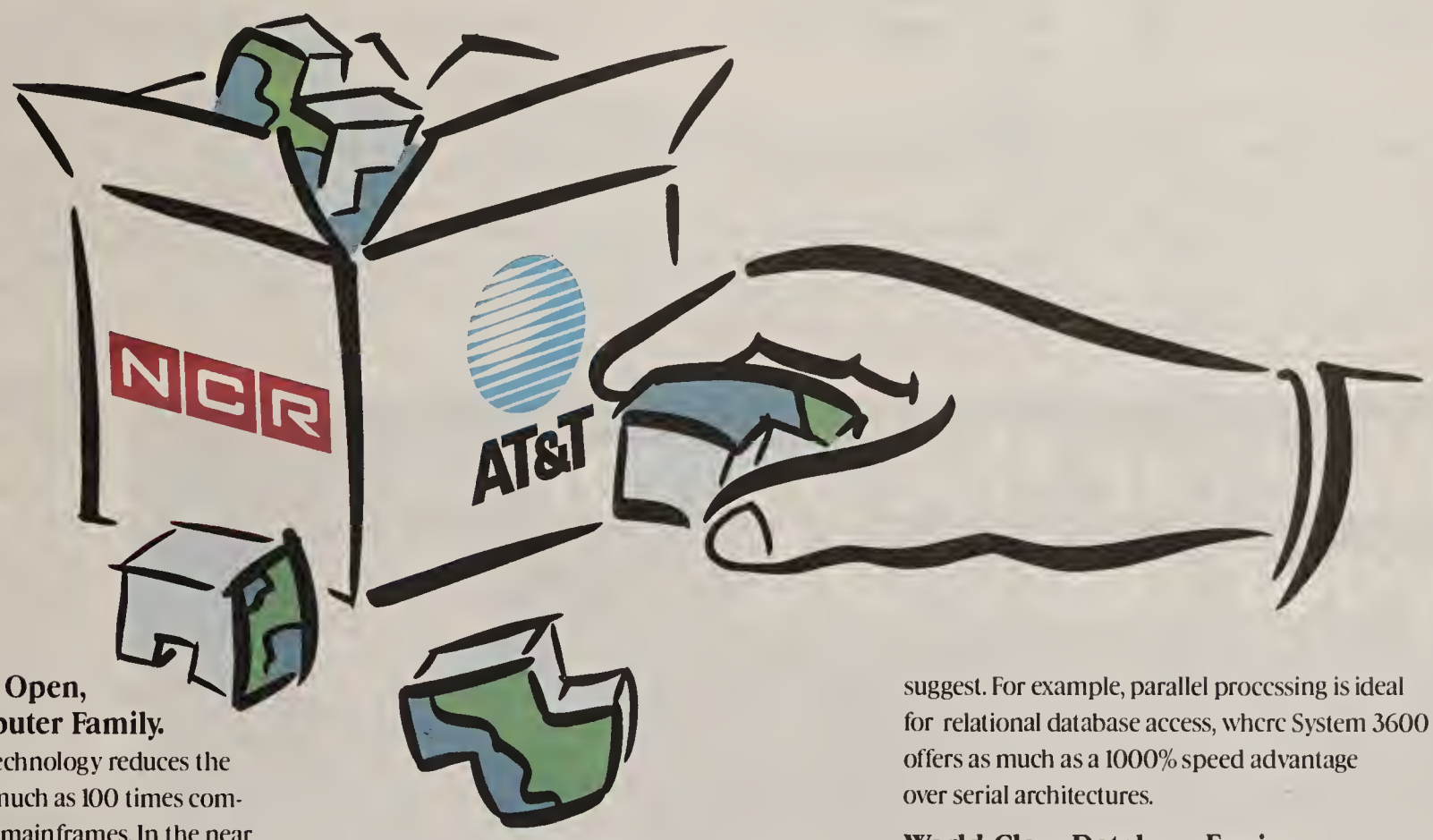
IBM's Cadam unit has released Version 3.0 of both IBM's CAD and CAD/Plus. IBM claims the desktop-oriented computer-aided design (CAD) packages offer a 300% increase in display performance for complex tasks such as associative dimensioning. Both packages are available now. CAD costs $1,595; CAD/Plus is priced at $2,295. A raster processing option, which both packages support, will ship in November and cost $2,000.

Autodesk, Inc., a Sausalito, Calif.-based software vendor and leader in the CAD software market, announced recently that it had sold more than 1 million software packages. Included in the figure were 500,000 copies of Autocad, 300,000 copies of Generic CADD and 200,000 copies of Autosketch. The company was founded in 1982 with $59,000 in capital and is now valued at some $1.3 billion.

Liant Software Corp. in Framingham, Mass., has announced the release of LPI-C++, a 32-bit compiler for use in multiplatform Unix environments. The compiler will initially be available for Intel 80386- and I486-based systems running Unix System V Release 3, but it is expected to be released for Scalable Processor Architecture systems running Sun Microsystems, Inc.'s SunOS and 80386 and I486 systems running Unix System V Release 4. The compiler is available for $1,295 per single user license. However, Liant has a special introductory price of $695 per copy until Jan. 31, 1992.

Fora, Inc., a San Jose, Calif.-based maker of portable computers, recently announced its third notebook, the NBX-386S/25. The notebook is based on Advanced Micro Devices, Inc.'s 25-MHz AM386SXL power management chip. Fora will sell the box with 4M bytes of RAM and a 60M-byte hard drive for $3,495. It weighs six pounds, claims a 3-hour battery life and has a 10-in., IBM Video Graphics Array-compatible screen.

Delivering The World's First Open, End-To-End Computer Family.



The World's Only Open, End-To-End Computer Family.

Microprocessor technology reduces the cost of processing as much as 100 times compared to conventional mainframes. In the near future, that cost advantage is expected to grow to more than 300 times.

The NCR System 3000 brings this revolution in technology to a complete family of scalable platforms, running open operating systems like UNIX,® OS/2 and MS-DOS. To give you the widest range of open computing options in the industry.

From mobile, pen-based computers to desktops and large servers to future massively parallel systems, the NCR System 3000 is the only truly open, completely scalable, computer family in the world.

"The 'Holy Grail' in the information industry is cheap, bountiful and easy-to-use computing in package sizes ranging from the personal desktop computer (or even the intimate handheld computer) to the enterprise-wide megaplex, preferably with the ability to upgrade through all points in between with minimum hassle. That ideal came closer to reality...when NCR announced its System 3000 family."

"No other 'traditional' vendor has yet announced an intention, much less demonstrated the capability, of doing anything close to NCR's System 3000 family."

—George Lindamood, Gartner Group May 29, 1991

The Personal Computers Designed Specifically For Enterprise Computing.

NCR's System 3000 workstations are designed specifically for mission-critical, enterprise applications. Our experience in tough commercial, retail, and financial service environments, coupled with our expertise in putting more power into fewer components have resulted in systems that meet the most demanding requirements.

All System 3000 workstation products are designed for the complexities of a multivendor, enterprise computing environment. And they are fully compatible with the larger members of the System 3000, providing you an unprecedented degree of scalability.

Mainframe Power At A Fraction Of The Cost.

At the high end, NCR System 3600 is the first open system with the power needed to handle mission-critical applications. It surpasses the performance of conventional mainframes. At a fraction of the cost.

System 3600's unprecedented performance is made possible by an innovative parallel processing architecture that allows compute- and I/O-intensive tasks to be shared by dozens of microprocessors. This gives the System 3600 raw computing power conventional mainframes can't match. Over 2000 MIPS today. Double that in the near future.

In certain applications, the System 3600 performs even better than those numbers suggest. For example, parallel processing is ideal for relational database access, where System 3600 offers as much as a 1000% speed advantage over serial architectures.

World-Class Database Engines.

Effective enterprise systems must be able to handle databases containing hundreds of gigabytes of information. Current mainframes can typically only manage 50-100 gigabytes. The System 3600 can handle databases up to 300 GB now, and far larger ones in the near future.

System 3000 database servers are also fault-resilient, offering 99.9% or greater availability. Combining high reliability with NCR hot-pluggable disk array technology makes System 3000 servers true world-class engines for mission-critical applications.

NCR System 3000. The power others talk about for tomorrow. Deliverable today. For more information, phone 1-800-CALL NCR.

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NEW PRODUCTS

Software applications packages

Power Up Software Corp. has created Express Publisher for Windows, a $249.95 desktop publishing software package for Microsoft Corp.'s Windows 3.0 environment.

Express Publisher provides templates for easy document creation, the firm said. Editable graphical page previews called Thumbnail Previews are included, as are object-rotation features and oversize document output.

The company has also announced Textappeal, a Windows-based type-styling package that offers drawing tools and graphics-import capabilities. Textappeal includes Adobe Systems, Inc.'s Adobe Type Manager and costs $129.95.

Power Up Software
2929 Campus Drive
San Mateo, Calif. 94403
(415) 345-5900

Visible Systems Corp. has built code-generation ability into its Visible Analyst Workbench computer-aided software engineering tool.

The tool now automatically produces C language and Cobol code from its repository, depending on application design specifications. The product can also generate SQL queries.

Pricing for the Visible Analyst Workbench starts at $3,995.

Visible Systems
950 Winter St.
Waltham, Mass. 02154
(617) 890-2273

Media Cybernetics, Inc. has upgraded Halo/Fx, its gray-scale image-editing software package for DOS.

Version 1.2 offers keyboard shortcuts, increased file format support and better memory handling and performance, the company reported. Halo/Fx includes posterization, inversion, cut-and-paste tools and airbrushing techniques.

The package costs $299. Upgrades cost $99.

Media Cybernetics
8484 Georgia Ave.
Silver Spring, Md. 20910
(301) 495-3305

Media Vision, Inc. has announced the Multimedia Upgrade Kit for converting personal computers into multimedia PCs.

The kit includes Microsoft Corp.'s Windows 3.0 environment with Multimedia Extensions 1.0, an on-line user manual, and proprietary mixer software and audio tracks. The kit is implemented on compact disc/read-only memory.

The cost is $999.

Media Vision
47221 Fremont Blvd.
Fremont, Calif. 94538
(510) 770-8600

Logitech, Inc. has announced Version 1.2 of its Catchword optical character recognition software package for personal computers.

Version 1.2 offers increased accuracy and performance. It is available as a standalone package for $249 or bundled with the firm's Scanman Model 32 gray-scale scanner and Graytouch image-editing software for $359.

Logitech
6505 Kaiser Drive
Fremont, Calif. 94555
(415) 795-8500

Structural Research and Analysis Corp. has enhanced Cosmos/M, a finite analysis tool in the firm's computer-aided software engineering line.

Cosmos/M Version 1.65 is an integrated set of modules for performing mechanical, structural, thermal and other optimization analyses. It adds modules for analysis of structural fatigue, crash dynamics and piping networks.

The Cosmos/M software runs on personal computers and a variety of workstations. Pricing for the basic system is $4,800 on PCs and $6,400 on workstations.

Structural Research and Analysis
Suite 200
1661 Lincoln Blvd.
Santa Monica, Calif. 90404
(213) 452-2158

Quicksoft has announced PC-Write Standard Level 2.0 for the personal computer.

The word processor adds mouse support, a thesaurus, automatic repagination and import/export file formats.

The product costs $129.

Quicksoft
219 First Ave. N. #224
Seattle, Wash. 98109
(206) 282-0452

Database management systems

Pro-Dvelbase, a nonprogrammable relational database management system, has been announced by Accelerated Software.

Pro-Dvelbase is compatible with Ashton-Tate Corp.'s Dbase file format. It allows users to design database systems without programming, the company said. It features query-by-example and mail-merge functions.

The product costs $250.

Accelerated Software
15910 112th St.
Edmonton, Alberta T5X 4X3
(403) 456-9163

More products on page 74

*"In a time of turbulence and change, it is more true than ever that **knowledge is power.**"* – Sir Francis Bacon

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Delivering The Promise Of Open Systems Takes Cooperation.

Integrating Open Systems Through COOPERATION.™

Conventional, proprietary systems have spawned islands of information that separate departments and impede workflow more effectively than any wall..

The answer is NCR COOPERATION. Software that integrates the general-purpose applications and platforms in your organization into one flexible, cooperative system with a consistent, intuitive graphic interface.

With the merger of NCR and AT&T Computer Systems Division, COOPERATION has been enhanced by the unique workflow automation capabilities offered by AT&T's Rhapsody.™

The result is an enterprise-oriented cooperative computing environment that has been recognized as superior to anything on the market.

"NCR will have the most advanced product out there. They have demonstrated the power of object-oriented computing."
—Steve Wendler, Gartner Group.

The Integrating Environment Revolution.

NCR COOPERATION is the first open, general-purpose integrating environment. It surrounds the operating system with applications, tools, and services that make more power more available than ever before.

COOPERATION uses leading-edge object technology, designed to integrate new and existing applications from many vendors, by providing a smooth exchange of data between the applications and by giving them a common look and feel..

A More Humane Human Interface.

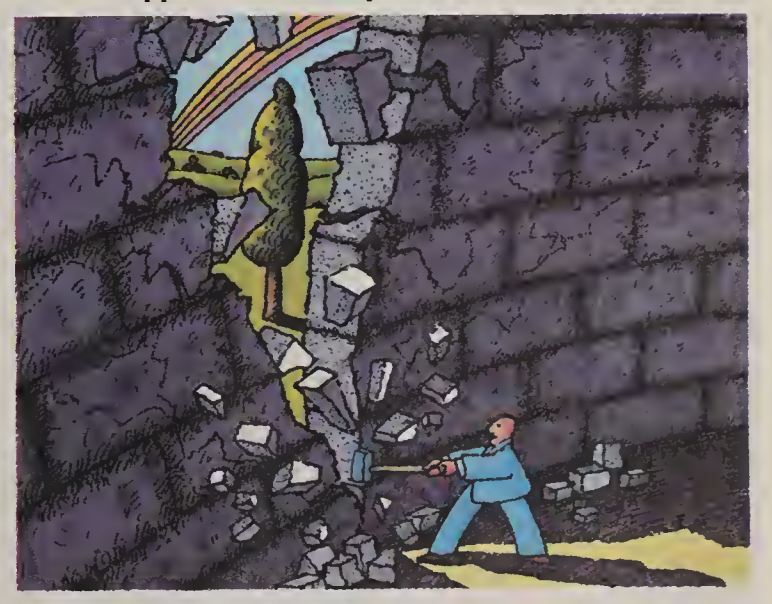
In COOPERATION's object-oriented human interface, icons are used to execute a series of tasks. For example, you simply select an icon of a report and the system will access databases throughout your enterprise, assemble the necessary information, and run the application you need to prepare the finished report.

By making the interface with the system both simpler and consistent across all applications, COOPERATION can help improve productivity, as well as reduce the time and cost of training.

The Rewards Of COOPERATION.

COOPERATION is designed to offer rewards for everyone in your organization. Top management will find its ability to unite the entire organization can improve responsiveness, strengthening your competitive position. While facilitating more cost-effective implementation of information systems and a faster return on your IS investment.

COOPERATION can help MIS managers integrate multimachine, multivendor, multistandard environments, providing the tools necessary to create and manage a complete enterprise-wide network. While lowering the cost of applications development.



And COOPERATION also aids software developers by simplifying the task of creating new applications.

COOPERATION can help your entire enterprise work together better than ever before. It can set your organization free from the rigid computer architectures of the past. Free from dependence on the vision of a single vendor. Free to meet the challenges of the future as you see fit.

To unleash the power of COOPERATION in your organization today, phone 1-800-CALL NCR.

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Systems

An add-in card allowing personal computer users to run Sun Microsystems, Inc. Sparcstation applications has been created by Opus Systems, Inc.

The Opus Sparcard Kit provides all required hardware, software and cabling. It includes 8M bytes of dynamic random-access memory and a version of Sun's SunOS 4.1.1 operating system. It also provides on-board Ethernet and DOS interface software.

Pricing is $4,495 for a diskless configuration. A 213M-byte hard disk costs $1,135.

Opus Systems
329 North Bernardo
Mountain View, Calif.
94043
(415) 960-4040

Unisys Corp. has released new personal computers in its PW2 Advantage Series.

The PW2 series includes a 20-MHz Intel Corp. 80386SX-based system and 25-MHz and 33-MHz 80386 systems. The computers include integrated Super Video Graphics Array adapters.

Pricing starts at $2,395 for the base configuration of the 80386SX system.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
(215) 986-4011

Peripherals

Logitech, Inc. has announced Fotoman, a portable digital camera that downloads photographs onto personal computers.

Fotoman ($799) works with the company's Fototouch image-editing software for Microsoft Corp.'s Windows 3.0. It can store up to 32 images.

Logitech
6505 Kaiser Drive
Fremont, Calif. 94555
(415) 795-8500

Micro Express has introduced three Video Graphics Array (VGA) adapters.

The 15-bit Hi-Color VGA Card ($220) offers 32,768 colors at 1024- by 768-pixel resolution. The Extended VGA Card ($170) offers 256 colors at 1024- by 768-pixel resolution. A 72Hz version of the Extended VGA Card (also $170) is offered as well.

Micro Express
1801 Carnegie Ave.
Santa Ana, Calif. 92705
(714) 852-1400

Macintosh products

Facit, Inc. has announced the P5160 laser printer for Apple Computer, Inc. Appletalk networks.

The P5160 is a 16 page/min. printer available with 17 or 35 Adobe Systems, Inc. Postscript fonts. It includes 2.5M bytes of memory, expandable to 4.5M bytes.

Pricing starts at $4,498.

Facit
University Center
400 Commercial St.
Manchester, N.H. 03108
(603) 647-2700

PC system software

Quantum Software Systems Ltd. has released QNX 4.0, said to be the first available real-time microkernel operating system.

QNX 4.0 is Posix-compliant and runs on any personal computer. It costs $795 for single node. Additional nodes on a network cost $695.

Quantum Software Systems
175 Terrence Matthews Crescent
Kanata, Ontario K2M 1W8
(613) 591-0931

Development tools

Silicon Valley Software has introduced the SVS C3 Code Construction Series, an applications development tool kit for DOS-based personal computers.

The product offers compilers for Fortran-77, ANSI C language and Pascal as well as a virtual memory extender and a debugger.

The Fortran version costs $395; C language and Pascal versions are priced at $325.

Silicon Valley Software
Suite 100
1710 South Amphlett Blvd.
San Mateo, Calif. 94402
(415) 572-8800

Delivering The World's Most Complete Open Networking Environment.

The World's Most Comprehensive Suite Of Connectivity Products.

Open Networking Environment (ONE) is the realization of our Open, Cooperative Computing strategy. It combines NCR's strength in industry-standard connectivity solutions with AT&T's broad range of advanced networking products.

As a result, we can offer networking solutions no other company can match. We're the UNIX® networking leader, and we have the people, the expertise, and the products, to implement your connectivity solutions, anywhere in the world.

ONE offers the first set of enterprise-wide networking products based on OSI. To give you transparent, enterprise-wide access across multiple networks, machines, and software. And ONE makes full use of the end-to-end scalability of the NCR System 3000 to bring new levels of power to your organization.

Freedom Of Choice At The Desktop.

The heart of our networking story is the StarGROUP/3000™ System, with the introduction of StarGROUP® LAN Manager 2.0. These cooperative software modules offer a full suite of enterprise connectivity options with a wide range of workgroup interoperability configurations, providing a comprehensive client/server environment for distributed applications.

StarGROUP/3000 gives you a powerful, flexible tool for making the transition from proprietary environments to ONE. You can grow from small LANs to large enterprise networks without architectural changes.

Broad Connectivity With Tight Security.

Our StarLAN and StarWAN™ products let you connect multiple LANs into a comprehensive enterprise-wide network. In the office. Across the country. And around the world. No other vendor currently offers a more complete, cost-effective set of networking solutions.

High performance LANs have never been so affordable. Our networking products use the inexpensive unshielded twisted pair, coaxial, and fiber optic wiring which are probably already installed in your facilities to build secure and reliable 1, 10, and 100 Mbps LANs. NCR WaveLAN™ offers wireless networking. And our FDDI and SmartHUB products offer multiple protocol support with leading edge security, monitoring, and reliability.

Enterprise Management For Your Enterprise Network.

Managing large networks and multiple networks is a critical task that will become even more critical in the future. StarSENTRY™ offers standard network management for today. And the ability to accommodate the anticipated standards of the future.

StarSENTRY lets you consolidate network management at a single platform located anywhere in the network. It gives you the tools to manage systems from multiple vendors. And the power to manage the large global networks of the future.

NCR's Open, Cooperative Computing strategy is a blueprint for managing change. A new way of computing–flexible enough to allow you to implement all or part of it, depending on your needs. A cost-effective, truly open, enterprise-wide solution with benefits that can help your organization compete more effectively in the years ahead.

To take delivery on the future of networking, phone 1-800-CALL NCR.

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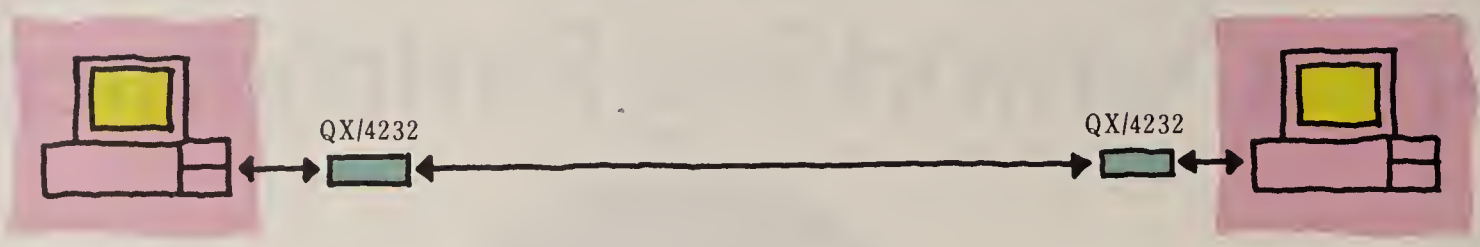
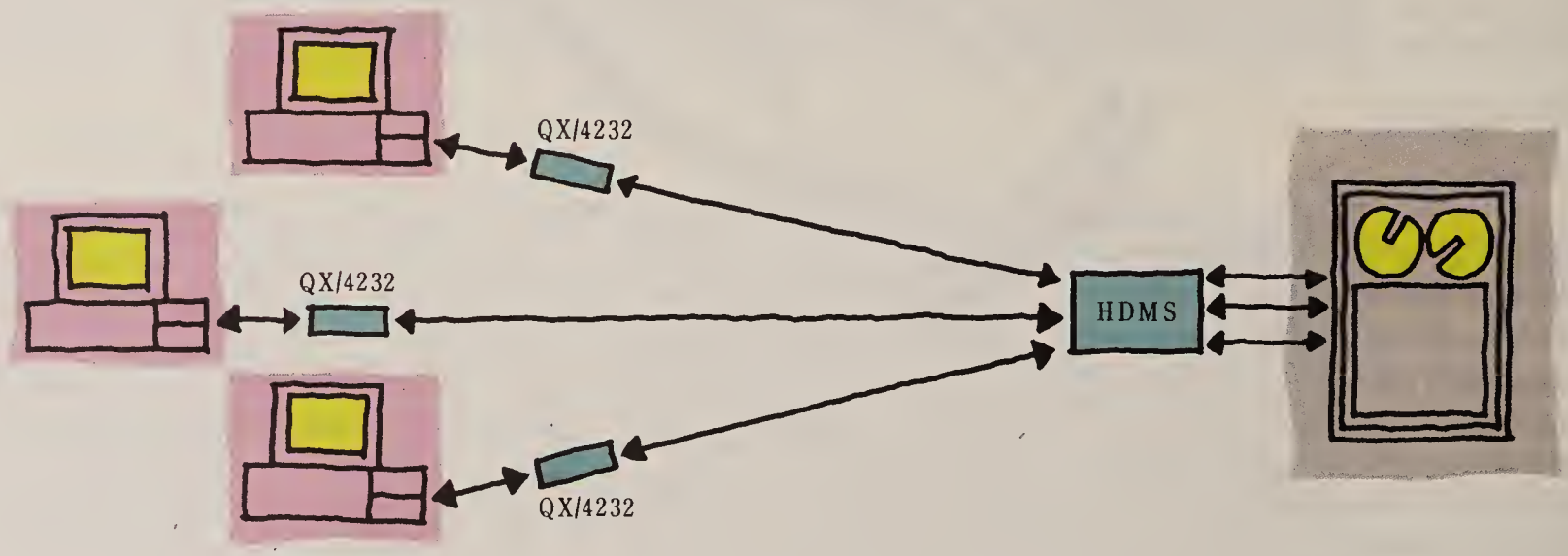


Our modem management system is in a class by itself.



Whether you're looking for a high performance V.32bis modem to provide one-to-one dial-up access to computing resources, or a multiple terminal to mainframe modem management system, Microcom® has what you need.

For unsurpassed V.32bis throughput, take our QX/4232*bis*™ modem. It transmits at up to 38,400 bps. And it's fully compliant with all existing standards worldwide including CCITT V.32bis, V.42 and V.42bis.

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NETWORK SHORTS

NT to show portables

Northern Telecom, Inc. will reportedly demonstrate its first wireless business communications system at the **Telecom '91** show in Geneva this month. The system is said to enable office workers to carry their telephone handsets with them around their offices.

In the wake of the recent telephone outage in New York that grounded hundreds of flights, the **Federal Aviation Administration** (FAA) has been given permission to establish its own nationwide telephone system for air-traffic control. Last spring, the FAA was ordered by the U.S. General Services Administration to put its plan to develop an ultrareliable system on hold and to use the standard, governmentwide Federal Telecommunications System-2000 networks.

Personal computer local-area network support is a new service from **TRW Customer Service Division** that offers network planners, managers and users a round-the-clock source for troubleshooting hardware and software. It is offered nationwide via a toll-free number.

Travelers' IS staff stays home

Insurer uses in-house 'know-how' to produce client/server installations

ON SITE

BY SALLY CUSACK
CW STAFF

HARTFORD, Conn. — While client/server enthusiasts are waiting anxiously for sophisticated performance and availability management tools to come to market, a leading financial services firm has rolled up its sleeves and built the necessary tools in house.

Using only internal resources, The Travelers Corp. has produced capacity planning methods and comprehensive remote diagnostic software for client/server installations nationwide.

Delvecchio *sees different flavors of client/server*

There is no typical client/server setup at The Travelers. Mike Delvecchio, technical director at the company, points to several different flavors of the technology both in development and out in the field.

He defines client/server as any two processes that rely on each other synergistically to produce work.

This can include personal computer to host, host to host or any other two machines operating together.

For example, there are applications that query knowledge-based engines for decision support and Easel-based applications that integrate information from IMS/CICS systems on a single screen for claims management.

When the company began formulating a client/server strategy two years ago, it discovered that support structures were nonexistent.

The Travelers had been running in a Systems Network Architecture (SNA) environment with IBM 3090-class mainframes at the data centers. Now, it is migrating to a flat local-area network environment with Netbios connectivity.

This will be the norm at most large installations, the result being LAN connectivity from every workstation to every other workstation, eventually replacing SNA connectivity and SNA protocols with LAN protocols.

Company research also revealed the need for effective capacity planning methods in the client/server world. To meet that need, The Travelers has built a series of benchmarks to gauge throughput capacity.

Continued on page 82

Competition, ratings clouding router market

BY JOANIE M. WEXLER
CW STAFF

The router market is awash with vendors scrambling to one-up each other on price/performance, the number of protocols routed, techniques for routing them and wide-area interface support.

The month preceding this week's Interop '91 show in San Jose, Calif., has seen market leaders and niche players alike arming themselves with high- and low-end products in hopes of grabbing a piece of the generous router market share still unaccounted for. The avalanche of announcements is leaving product differentiation a blur in the minds of many.

"The differences between products are becoming less and less obvious," said Todd Dagres, director of data communications research and consulting at the The Yankee Group, a Boston-based consultancy. "The vendors now seem to be on a horsepower kick," touting throughput as their strength, he added.

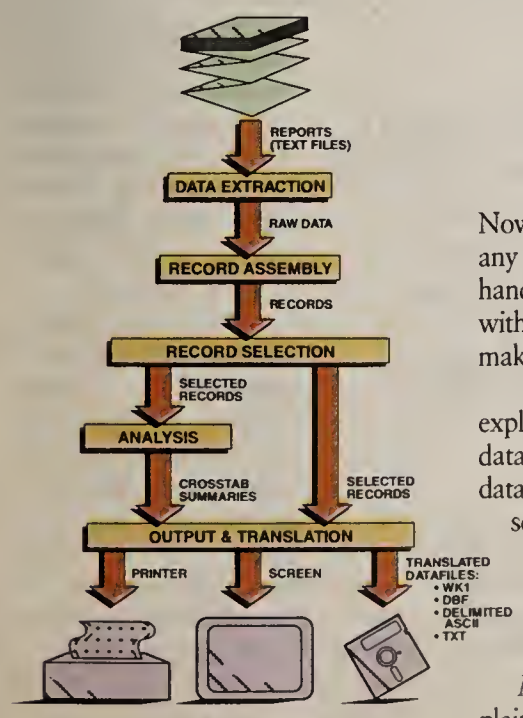
A recent example is Proteon, Inc.'s upgrade of its bridge/routers to address both IBM and Digital Equipment Corp. networking environments. Proteon's gear will now bridge local-area network traffic between Ethernets and 100M bit/sec. Fiber Distributed Data Interface (FDDI) LANs while simultaneously source-routing IBM Systems Network Architecture terminal and LAN traffic.

The vendor has touted throughput of 25,000 packets per second for under $20,000 on its reduced instruction set computing architecture. Dagres, however, noted that users "shouldn't pay too much attention to performance claims" because router throughput will differ depending on which protocol is being benchmarked at any given time.

In addition, said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C., "Performance ratings are only made at fixed packet sizes. A user's packet sizes may be entirely different."

The Proteon announcement follows a recent move by major router player Cisco Systems, Inc. to connect T3 ports over a high-speed serial interface amidst the LAN-WAN internetworking hoopla. Prior to that, router heavyweight Wellfleet Communications, Inc. announced a whole new router architecture with a 1G bit/sec. backplane supporting multiple

Continued on page 83



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U.S. looks for new weather data sources

BY J. A. SAVAGE
CW STAFF

The nation's only weather satellite is running out of fuel.

With the death of that satellite, the U.S. will face the near certainty in a little over a year that there will be no prediction data flowing to meteorologists, pilots, navigators and others. The crisis has led the National Weather Service to experiment with data alternatives to the satellite to piece together a contingency plan.

The dying satellite, GOES-7, for Geostationary Operations Environmental Satellite, sends photographic images and data about temperature and water vapor that meteorologists use to create their forecasts. It hovers 23,000 miles above the U.S.

'No ideal alternative'

"Loss of the satellite means that the imagery you now see on TV won't be there, and there is no ideal alternative," said Michael Steinberg, vice president of Accu-Weather, Inc., a State College, Pa.-based commercial weather-image distributor.

Although it was not noticeable on the evening news, the weather service committed one of its data and image distribution channels — dedicated phone lines — for 48 hours to send out data gathered from a European weather satellite, military satellites and some National Oceanographic and Atmospheric Administration (NOAA) research satellites.

About 20 weather stations from Anchorage, Alaska, to Wallops Station, Va., are evaluating the pieced-together images and other data from the weather service to see how badly GOES-7 will be missed and whether the nation needs to rent time on European or Asian weather satellites until a new GOES can be put in orbit. More such experiments are planned to help the service put together an interim system.

Using other nations' satellites would cost nearly $200 million because new ground stations would have to be built to receive the data, according to Gary Hufford, regional chief scientist at the weather service in Anchorage. He said the cost of the GOES was $60 million.

Next August, when the 5-year-old GOES-7 runs out of the fuel to keep it positioned correctly, it will become unreliable. Soon after, it will become completely unusable, according to Hufford. A backup satellite was lost in the *Challenger* shuttle disaster in 1986. Another satellite was supposed to go up late this year, but Hufford said it may never be launched because of mechanical problems.

Last month's experiment was the first national test to see what will happen when GOES-7 is gone. In the test, called NOGOES, the weather service took one of its redundant data lines, which distributes GOES-collected information, and dedicated it to data gathered from other sources "to evaluate other sources for meteorological utility," according to Andrew Noel, meteorologist with the weather service's satellite program in Silver Spring, Md.

When users dial into the service's computer and select the type or types of data desired, it comes back to the user in raw format. On the experimental line, images were very different from what meteorolgists are accustomed to. "The difference in looking at a snapshot from a satellite that's 23,000 miles up is one of a complete view of the states vs. a partial one," Hufford said. Meteorologists have to extrapolate the data differently to make sense of it, he said, and the experiment was to find if, indeed, they could manage it.

During the experiment, regular GOES information was also available for the more than 250 public and private agencies that tap into it, according to Dane Clark, deputy division chief for the weather service's Satellite Service Division in Camp Spring, Md. Those users can download several types of data, from temperatures to humidity to crude cloud-pattern photographs. Commercial outfits, such as Accu-Weather, use computer technology to glamorize those images and get the moving cloud patterns seen on TV news.

Weather information *generated from data gathered by a polar orbiting satellite is made into maps by an HP workstation*

The nation's most sophisticated weather technology was not included in the experiment because the weather service's distribution system can only make information available in analog transmissions, Clark said. The system was developed in the 1960s, and the recording devices use an analog signal only.

That sophisticated technology was recently installed by the weather service in Anchorage, using Hewlett-Packard Co.'s HP 9000 Model 720 reduced instruction set computing workstations to take image and temperature information off of a polar-orbiting NOAA research satellite and crunch it into sophisticated computer images.

Manipulates images

Unlike the data and images fed from the service's headquarters, Anchorage can manipulate images to find specific patterns without having to enhance the images first, as Accu-Weather does with mainframes for weather service data in the lower 48 states.

The weather service itself is still crunching data from GOES-7 on a Data General Corp. Eclipse minicomputer installed in 1978.

A special card to convert Anchorage's digital images — which appear on a color monitor as moving patterns that can be custom-enhanced to point out particular features — was damaged in transit and could not be rebuilt in time for Anchorage to send its weather information out in the NOGOES test, according to Hufford. That information covers the U.S. as far south as Southern California and as far east as Colorado.

Products focus on increased need for mainframes to work as LAN servers

BY ELISABETH HORWITT
CW STAFF

BROOMFIELD, Colo. — McData Corp. has upgraded its 6100 line of communications controllers to provide many of the same capabilities as an IBM 3172 model, plus added value. The vendor has also announced that its Linkmaster 5300 channel extender now supports the High Speed Serial Interface (HSSI).

McData's Linkmaster 6100 Network Gateway-Server addresses a user need — "people trying to get their mainframes to function more effectively as LAN server platforms," said Rick Villars, director of networking architectures at International Data Corp.

This market is growing rapidly as companies move more aggressively into client/server computing, Villars said. For this reason, IBM — or at least some of its divisions — welcomes system compatibles such as McData's even though they take some of IBM's communications controller revenue, Villars added.

The gateway emulates a 3172 in that it can interconnect devices on an Ethernet local-area network to an IBM mainframe, either via direct channel connection or via remote VTAM-based link, the vendor said. Also like the 3172, it can act as a remote gateway between two host channels.

The new product also shares the 3172's two-way communications with IBM's Netview, enabling users to use the host-based management system to manage all of their Systems Network Architecture (SNA) equipment, including McData's.

In addition, the 6100 gateway is said to act as a translator between devices using Open Systems Interconnect (OSI), Digital Equipment Corp.'s Local Area Transport (LAT) and Transmission Control Protocol/Internet Protocol, so that they look to an IBM host such as 3270 terminals, according to McData group product manager Brian Witt.

In contrast, the 3172 passes such protocols untranslated to the host, requiring the mainframe to do its own translation, using such cumbersome products as IBM's OSI Communications Subsystem, Witt said.

The translation capability is turning out to be extremely useful for the Air Force's Headquarters System Replacement Program, according to Michael Parsons, a Grumman Corp. network engineer assigned to the project.

"Unlike the 3172, the 6100 can be configured as a server so that it can change a Telnet device, such as a [DEC] VT100 or 220, into a 3270 device." The fact that McData's product can be managed by Netview is also a key feature, Parsons said.

The server is also said to provide the translation that allows non-SNA devices, such as Telnet or LAT controllers, to communicate with multiple mainframes over a Token Ring LAN. And it can be managed by the Simple Network Management Protocol as well as by Netview, McData said.

> BECAUSE OF RAPID market growth, IBM is welcoming system compatibles from other vendors even though they take some of IBM's communications controller revenue.

The Linkmaster 6100 Network Gateway-Server is scheduled to ship in the fourth quarter. Prices range from $12,360 for a base gateway to $39,500 for a remote channel-to-channel configuration with full networking capabilities.

The 6100 server does not have the 3172's ability to attach to IBM's Enterprise System Connection or Fiber Distributed Data Interconnect networks, McData said. However, the product is scheduled to get an Escon connection by the first quarter of next year.

McData also announced the Linkmaster 5300 HSSI System. Originally developed by Cisco Systems, Inc. and on its way to becoming an industry standard, HSSI lets interconnectivity devices dynamically share bandwidth within a 45M bit/sec. T3 link, Witt said.

This would enable a company to dole out T3 bandwidth among bridges, routers, channel extenders and other high-speed devices on an as-needed basis, instead of having to allocate T1 or T3 links to each device, he added. In addition, a channel extender such as McData's can divide a single T3 link among, for example, an IBM tape drive that sends at 12M bit/sec., and an IBM cartridge tape drive that sends at 20M bit/sec., Witt said.

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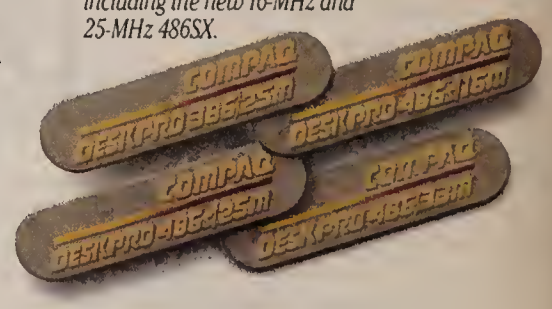

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International audio standard could boost videoconferencing

BY JOANIE M. WEXLER
CW STAFF

Slashed travel budgets, the National ISDN-1 initiative, falling prices and equipment enhancements are contributing to videoconferencing's metamorphosis from a gee-whiz, boardroom technology to a common communications vehicle.

However, users noted that still lacking is an audio compression standard to make various vendors' equipment interoperable and to allow customers to "take advantage of price and feature competitiveness," said Greg Chartrand, communications manager at the Superconducting Super Collider Laboratory in Dallas.

There is a near-complete international standard — dubbed "Px64" — for compressing video, which most vendors support in its latest form. However, "Px64 is still missing voice compression and assumes full noncompressed digital audio. This means audio consumes a full 64K bit/sec. channel," Chartrand explained. "Modifications would compress audio down to 16K bit/sec., allotting more bandwidth to video."

The laboratory uses Videotelecom, Inc. equipment to conduct interactive conferences with high-energy physics experts in Japan and Italy over Integrated Services Digital Network (ISDN) service. Domestically, the laboratory sends its video over dedicated T1 lines because of sparse ISDN service availability in this country.

This situation is slated to shift in mid-1992, when National ISDN-1 — an initiative announced in February for standard ISDN interface implementations across telephone company switches and customer premises equipment — results in broader ISDN offerings. Chartrand said he expects to move all his video traffic onto ISDN.

The top three video vendors now all combine Basic-Rate Interface (144K bit/sec.) ISDN, public-switched and leased digital traffic through multipoint bridges. This is necessary to bring the gamut of switched and dedicated traffic onto a common videoconference network from remote corporate and business partner sites.

Picturetel Corp. caught up to competitors Compression Labs, Inc. and Videotelecom last month when it announced its multipoint bridge — the M-8000 — with in-band audio capabilities.

Bundling audio with video traffic "means that users can pay for just two 56K bit/sec. lines instead of requiring a third line and a separate phone call for the audio," observed Greg Cline, communications technology services program manager at Information Strategies Group, Inc., a research firm in Vienna, Va.

Video equipment costs have dropped over the last decade, from approximately $500,000 to roughly $50,000 per location, Information Strategies said. The firm predicted the video systems market will see a 60% compound annual growth rate through 1993 but will then slow as videophones are widely introduced.

Travelers

CONTINUED FROM PAGE 77

Traditional SNA host systems have plenty of capacity planning tools, but those for client/server LAN systems are lagging far behind.

The benchmarks, written in C, simulate user loads to determine server capacity limits in terms of the number of users and response times on a given system.

This takes the guesswork out of server selection, and the company saves money by not overpurchasing horsepower for a particular job. More importantly, The Travelers has produced an OS/2-based omnibus software tool — Aegis — to assist in OS/2 workstation management.

Delvecchio said he likens Aegis to a remote job-entry system. Via IBM's SPM/2 software, Aegis examines internal performance of target machines in a LAN environment and monitors I/Os per second, data fluctuations and CPU rates.

At present, Aegis is configured to monitor OS/2 servers. The gathered data is used for problem management, altering configuration parameters and determining errors. By allowing systems to communicate on a peer-to-peer named pipes system, the program does not require server intervention to complete an I/O.

"Any command that can be executed from an OS/2 command line can be executed from Aegis," Delvecchio said.

By year's end, the company plans to deliver several more programs for remote management, including stall detectors, application timers and generic alert mechanisms.

The key, Delvecchio said, is in keeping the software "easy to use and easy to learn." The objective is to provide glasshouse support in a LAN environment.

"We assumed a risk, we spent some money. This was an integral part of our overall systems support plan," he said. "We've minimized the risk of rolling out mission-critical OS/2 applications by providing the required support structures."

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Netware Technical Journal

"THE FASTEST CARD WE TESTED"
Networld

Frame-relay products take center stage at TCA

BY ELLIS BOOKER
CW STAFF

SAN DIEGO, Calif. — There was an unmistakable surge of excitement two weeks ago at Tele-Communications Association '91 at the prospect of cheaper LAN-to-LAN interconnections using frame relay, a fast-packet protocol for data communications.

Equipment vendors and carriers arrived with frame-relay products, prices and service plans. Meanwhile, some analysts projected an historic swing away from private leased lines, given the bandwidth flexibility and cheaper prices promised by frame-relay networks.

"It'll trigger the most extensive wave of changes [in private network design] since the mid-1980s," said Thomas H. Jones, vice president of marketing at Netrix Corp. in Herndon, Va.

Other observers, however, were more conservative. "People will not all simultaneously or even in a period of séveral years make the move to [public network-base] frame relay," predicted Philip R. Evans, director of telecommunications at FMC Corp.'s corporate data center in Dallas. Some special applications will still demand dedicated facilities, Evans said.

One of the problems for potential frame-relay users, Evans said, is the lack of network monitoring, simulation and design tools. Properly loading a frame-relay network is important to avoid throughput-compromising congestion, a problem encountered by some early adopters of frame relay on private networks.

Among the vendors introducing frame-relay products were the following:

- Fastcomm Communications Corp. in Sterling, Va., announced availability of Fastpak, a line of frame-relay hardware products. Fastpak includes a proprietary compression algorithm for reducing Synchronous Data Link Control traffic on T1 lines by over 70%, Fastcomm said.
- Gandalf Systems Corp. in Cherry Hill, N.J., introduced the Infotron 2000, a family of branch-, region- and central-site communications switches.
- Dynatech Communications, Inc. announced plans for frame-relay software on its high-end packet switches. The software upgrade is expected to be available in December for $5,000.

Other announcements centered on Integrated Services Digital Network (ISDN) products, including the following:

- UDS Motorola in Huntsville, Ala., brought seven wide-area network products to the show, including the $1,395 TA120 ISDN terminal adapter, which links a personal computer with Basic-Rate Interface ISDN central office telephone switches from either Northern Telecom, Inc. or AT&T.
- Ricoh Corp. claimed a first with its FAX7000I, what it calls the first Group 4 fax with a built-in ISDN interface. Available this month, the product will sell for $14,495 and will also be available as a $3,500 upgrade for FAX7000 models.
- Republic Telcom Systems in Boulder, Colo., introduced its RLX-4N SD packet multiplexer, updated with software intelligence, to access carriers switched digital 56K- and 64K bit/sec. services for domestic and international networks.

Router market

CONTINUED FROM PAGE 77

high-speed local- and wide-area interfaces.

Dagres commented that Proteon's one point of differentiation among many vendors who "all support all the protocols and interfaces" is that it uses a translation bridging scheme for transporting traffic between FDDIs.

This means the bridge converts Ethernet packets into FDDI packets and vice versa, rather than enveloping one type of data packet inside another to make the two networks think they are speaking the same protocols. The latter method, known as "encapsulation," tends to be more overhead-heavy.

At the low end, Hewlett-Packard Co. and Xyplex, Inc. last week announced work-group routing products. HP said its $9,000 four-LAN Ethertwist multiprotocol router — announced in June — will support X.25 traffic and Open Shortest Path First (OSPF) on Nov. 1. OSPF is a way for routers to determine the most network-efficient path for data to move to its destination and allows interoperability among different vendors' routers.

"HP is attempting to figure out some of the router pricing issues," Dzubeck said. "Their intent is to start at the bottom, make routing less complex and make the cost proportional to the complexity."

However, Janet L. Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass., said HP's router is "expensive for the low end." She acknowledged, though, that "every piece of HP equipment I've ever seen is elegantly engineered. HP recognizes that its reseller distribution strategy means they have to make this stuff as easy as possible for resellers to install."

HP said its routers would support frame relay in the second quarter of next year and a Switched Multimegabit Data Service interface in late 1992 or early 1993, depending on availability of the service from local telephone companies.

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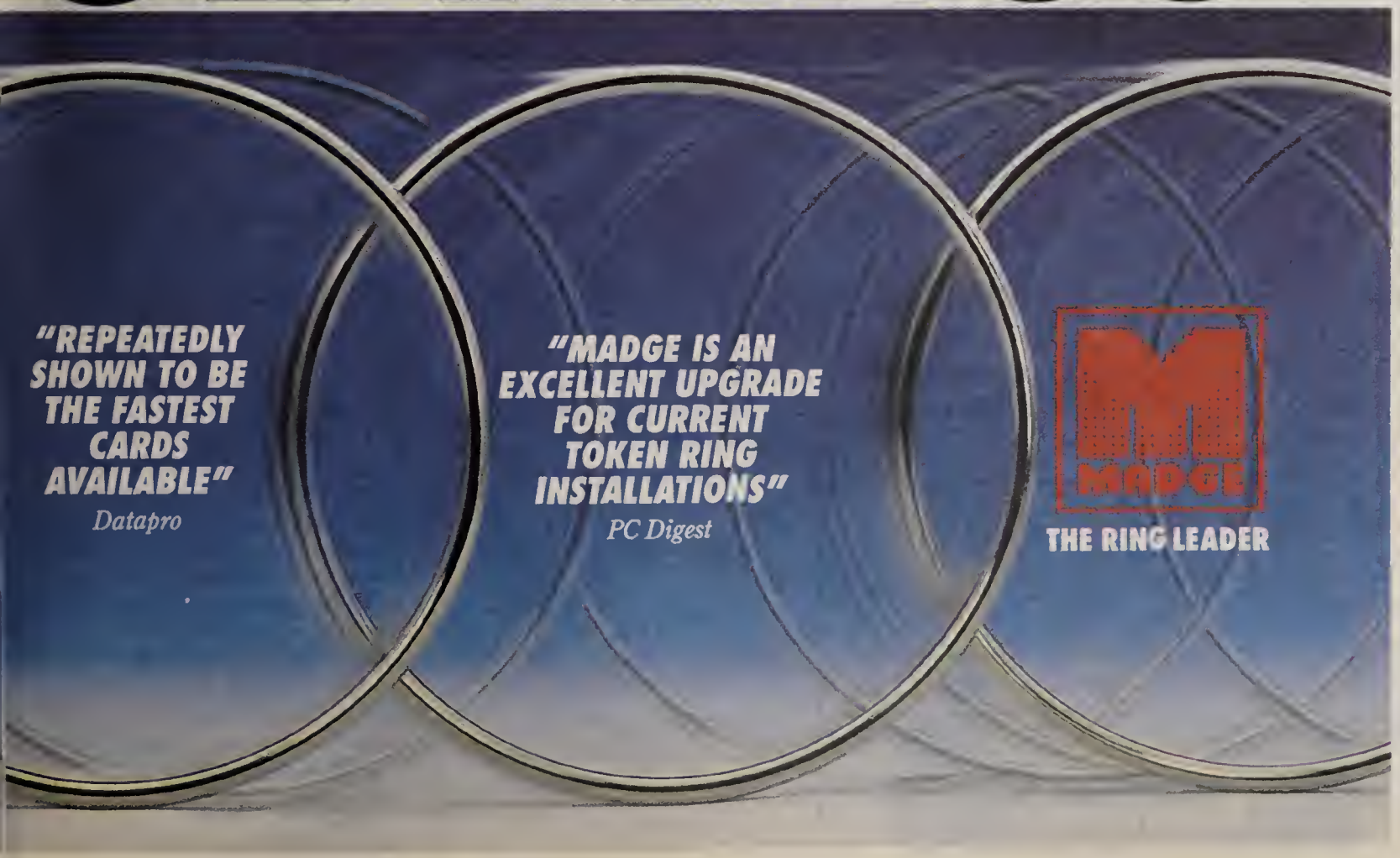

NEW PRODUCTS

OS/2 networking

Essex Systems, Inc has announced Release 1.3 of TCP/2, its software package providing Transmission Control Protocol/Internet Protocol support for OS/2-based personal computers.

TCP/2 can be run in an OS/2 Presentation Manager window under all versions of OS/2. The new version can run concurrently with Novell, Inc.'s Netware 1.3.

A single license for the TCP/2 software package costs $475. A DOS-based version is also available for $375.

Essex Systems
One Essex Green Drive
Peabody, Mass. 01960
(508) 532-5511

Electronic mail

Business Partner Solutions, Inc. has introduced AS/Messenger for the IBM Application System/400 platform.

With AS/Messenger, messages can be sent from an AS/400 to paper, handheld terminals, voice-response units or another AS/400. Two-way communication is possible with some devices.

During times of inactivity, a periodic system pulse can be sent to ensure that the system is functioning properly.

Tiered pricing ranges from $995 to $23,622, depending on hardware platform and modules selected.

Business Partner Solutions
Suite 214
2 Salt Creek Lane
Hinsdale, Ill. 60521
(708) 323-9292

Modems

Telebit Corp. has announced a high-speed V.32bis modem, the Telebit T3000.

The modem provides an interface rate for throughput as high as 57,600 bit/sec., the company said. It also includes a list of 15 commonly used configurations that can be selected from the front panel.

The Telebit T3000 is priced at $1,095.

Telebit
1315 Chesapeake Terr.
Sunnyvale, Calif. 94089
(408) 734-4333

Best Data Products, Inc. has announced the Smartone 9624FX, a class II fax/modem priced at $299.

The device features 9,600 bit/sec. send-and-receive fax capability and 2,400 bit/sec. data modem functionality. It is upgradable for use with Microsoft Corp.'s Windows 3.0.

The company also introduced the Smartone Macfax model for use with Apple Computer, Inc. Macintosh systems. It also costs $299.

Best Data Products
9304 Deering Ave.
Chatsworth, Calif. 91311
(818) 773-9600

Gateways, bridges, routers

Intercomputer Communications Corp. has released ICC/RLN, a protocol-independent remote access product.

ICC/RLN allows remote personal computer users to connect to a local-area network over dial-up lines. A single dedicated server PC can simultaneously connect up to 16 remote nodes to the LAN, with each remote PC having a unique Ethernet address.

Pricing for a two-client system is $380. A 16-port system, including an adapter board for the server, costs $6,210.

ICC
8230 Montgomery Road
Cincinnati, Ohio 45236
(513) 745-0500

Systems network architecture

Sync Research has announced the Group Poll Concentrator (GPC) for its line of Systems Network Architecture internetworking products.

The company's SNA Network Access Controller (SNAC) connects non-Token Ring compatible controllers to Token Ring networks.

The GPC performs all polling functions for units connected to the controller, allowing the host to poll the SNAC once rather than polling each physical unit attached to the controller. This reduces network overhead significantly, according to the company.

The SNAC/GPC is priced from approximately $10,000 to $15,000.

Sync Research
7 Studebaker
Irvine, Calif. 92718
(714) 588-2070

Local-area networking software

Pinnacle Publishing, Inc. has announced an upgrade to Netlib, a library of networking functions for Nantucket Corp.'s Clipper development environment.

Netlib 5.2 offers multiple-record locks, data encryption, print-queue management and other enhancements.

Pricing is set at $299.

Pinnacle Publishing
28621 Pacific Highway South
Federal Way, Wash. 98003
(206) 941-2300

Terranetics has announced Safedeposit, an unattended-backup utility for Apple Computer, Inc. Appleshare networks.

Safedeposit continuously backs up files residing on the server. It can be used in conjuction with the company's Autoback product, which uses the server to create backup copies of files residing on client Macintoshes on the network. The product automatically backs up those files that are being altered.

Licensing costs $595 per server kit or $4,500 for a 10-server pack.

Terranetics
Suite 413
1538 N. Martel Ave.
Los Angeles, Calif. 90046
(818) 446-7692

Local-area networking hardware

Megahertz Corp. has redesigned its external and internal Token Ring connectors for Toshiba America, Inc. portable computers.

Both versions offer 16M/4M bit/sec. operating speeds. The adapters connect directly to the system bus, offering full-speed performance, the company reported. The card provides both a DB-9 connector and an RJ-45 connector.

The price for the internal card is $799. The external adapter costs $999.

Megahertz
4505 S. Wasatch Blvd.
Salt Lake City, Utah 84124
(801) 272-6000

Chipcom Corp. has announced a 10Base-T intelligent work group hub for small Ethernet networks.

The hub provides 12 ports and supports the Simple Network Management Protocol on unshielded twisted-pair Ethernet local-area networks. It was designed as a low-end alternative to the company's Online System Concentrator fault-tolerant wiring hubs.

The 10Base-T Workgroup Hub costs $2,295.

Chipcom
Southboro Office Park
118 Turnpike Road
Southboro, Mass. 01772
(508) 460-8900

Panamax has produced the Nonstop Uninterruptible Power System for local-area networks.

The system includes models ranging from 450VA to 1,300VA. A network interface is included with all models except the 450VA version.

Pricing ranges from $429 to $1,199.

Panamax
150 Mitchell Blvd.
San Rafael, Calif. 94903
(415) 499-3900

Madge Networks, Inc. has introduced a 16M/4M bit/sec. Token Ring adapter card for personal computers.

The Madge Smart 16/4 PC Ringnode adapter is an 8-bit card that works with AT/XT-bus and Extended Industry Standard Architecture personal computers. It is software upgradable. The company also offers 32-bit and 16-bit cards.

The 8-bit card costs $795 or $695 in quantities of 10.

Madge Networks
Suite 150
42 Airport Pkwy.
San Jose, Calif. 95110
(408) 441-1300

Milan Technology Corp. has introduced a print server that was developed for Unix networks running Transmission Control Protocol/Internet Protocol.

The Esprint server simplifies printer installation and configuration. The server includes a 16-bit processor and achieves sustained throughput of 30K byte/sec., the company said.

The product supports two printer connections and three types of Ethernet cabling.

Esprint costs $899.

Milan Technology
Suite 3
67 E. Evelyn Ave.
Mountain View, Calif.
94041
(415) 968-9000

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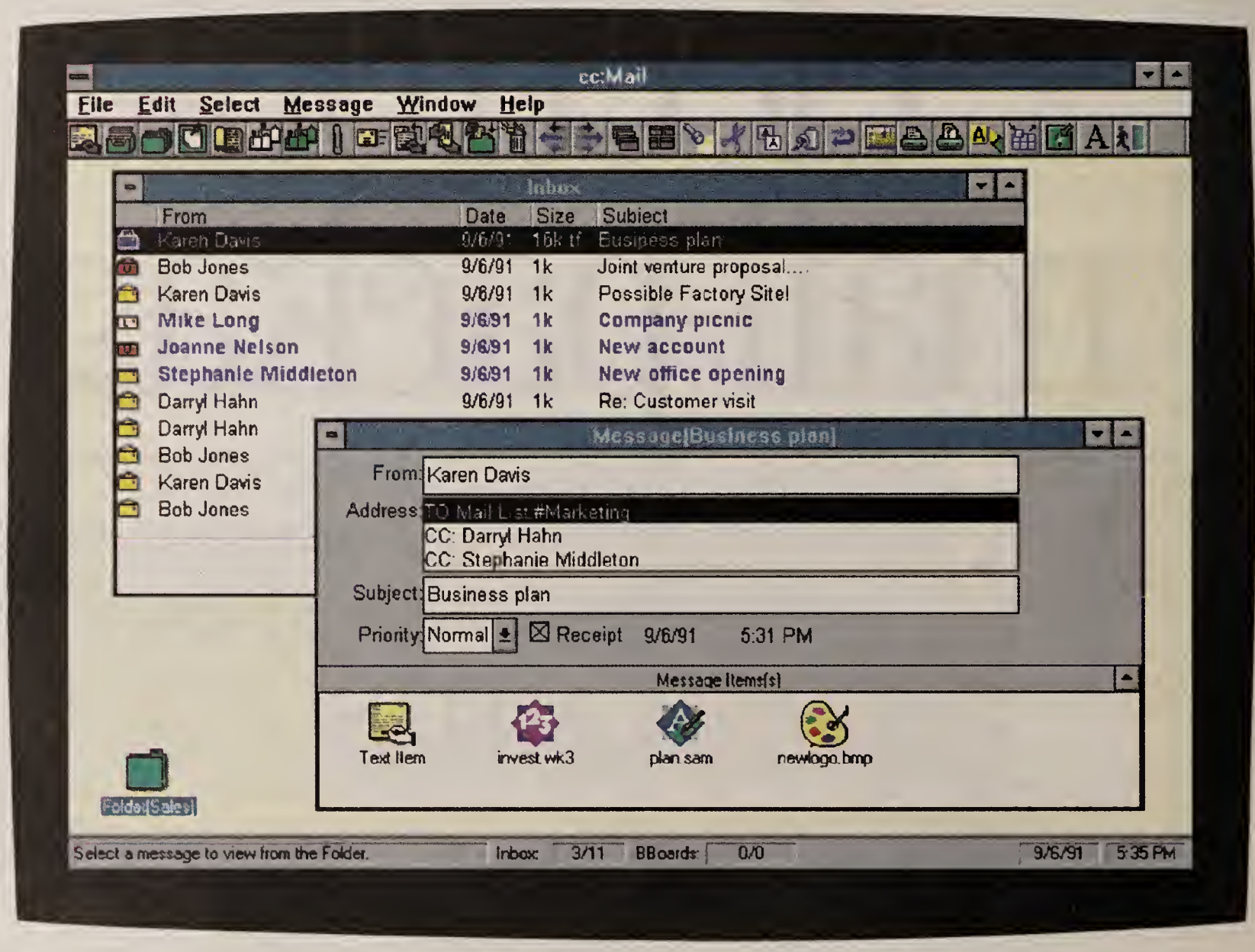
cc:Mail is so easy to install, learn and use, you can have your electronic mail system up and running in almost no time.

Only cc:Mail can send information across all of these computing platforms to reach everyone in your organization.



Over a million satisfied customers have already given cc:Mail a first-class rating. For example, Windows users love its easy-to-use interface, SmartIcons™ and dialog boxes. And PC World *says "Sending a cc:Mail message is easier than addressing an envelope and licking a stamp." 9/91*

at it delivers.

Its state-of-the-art, third-generation architecture will meet your messaging needs as your company grows.

You can send a file from any mail-enabled application, such as 1-2-3 for Windows and Ami Pro for Windows and other leading software programs without leaving the application.

Keep things running on time with cc:Mail's advanced integrated calendaring and scheduling option.

It's easy to see why cc:Mail from Lotus® is so popular. Because it delivers more than messages. It handles just about any electronic mail need you might have. No matter how large or small your workgroup is. With it you can send text, files, graphics, and facsimile across all major local area networks such as Novell®, LAN Manager and Banyan.® Without needing new hardware.

Better still, it's the only system that allows you to send electronic mail effortlessly back and forth from different platforms—such as DOS, Windows™ 3.0, OS/2® and Macintosh—across the same LAN, without the need for gateways.

LAN TIMES READERS CHOICE 1990 1991

Plus, with cc:Mail you can access public mail and even mainframe mail quickly and easily.

Our newly released cc:Mail for Windows takes full advantage of Windows 3.0. Support of Dynamic Data Exchange lets you easily send other mail-enabled Windows files from within those applications. For example, you can send a report you've written with Ami Pro for Windows across the country while the application is still on your desktop.

Plus, cc:Mail is the first package of its kind to take advantage of a new, fully scalable messaging architecture. This means cc:Mail will grow along with your business. Whether you're adding two new users, 20,000 or 200,000, cc:Mail is a proven solution.

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It's true. When you think of its scalability, its high performance and its complete connectivity, no other electronic-mail package even comes close. So whether you're a LAN administrator, an IS manager or an end user in a small or large company, cc:Mail delivers everything you've been looking for. From its intuitive interface to its ability to send compound documents with multiple mixed media items in a single "envelope." For a free demo disk of the Macintosh, Windows or DOS Platform Pack of your choice, call us today at **1-800-448-2500.**

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PC WEEK 10/22/90

"Lotus' cc:Mail for DOS 3.2 and its Windows version 1.0 offer everything you need in messaging mail management and connectivity. Intelligent menu organization makes both DOS and Windows versions a breeze to learn and use. It's clearly a best buy."
PC WORLD 9/91

cc:Mail from Lotus

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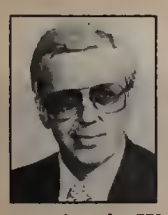
EXECUTIVE TRACK

The **U.S. Internal Revenue Service** has announced three new appointments to information systems-related positions:



Michael S. Bigelow was named deputy assistant commissioner for returns processing in Washington, D.C. He succeeds Chuck Guy, who became district director in Wilmington, Del.

Bigelow had been the IRS' deputy assistant commissioner for IS management since last year. Before that, he was assistant director of IRS service centers in Philadelphia and Ogden, Utah. He joined the IRS in 1968 and has completed the IRS executive selection and development program.

Bruce L. Pitt was named to replace Bigelow as deputy assistant commissioner for IS management. He will assist the chief information officer in managing the IRS tax-processing systems and in developing data administration requirements governing all tax-processing initiatives.

Since 1988, Pitt has been assistant regional commissioner for data processing in the IRS central region in Cincinnati.

After completing the IRS executive selection and development program in 1985, Pitt was assistant director at service centers in Kansas City, Mo., and Fresno, Calif.

Henry O. Lamar Jr. was appointed assistant regional commissioner for data processing at the IRS central region office in Cincinnati, replacing Pitt. The regional office processes returns from Indiana, Kentucky, Michigan, Ohio and West Virginia.

Lamar has been assistant director at the Atlanta service center since 1989. He completed the executive selection and development program in 1987 and became assistant to the director of the Memphis service center.

Password: User awareness

Companies promote importance of data security with varied approaches

BY MICHAEL ALEXANDER
CW STAFF

In the weeks leading up to Friday, Sept. 13, the computer security troops at Metropolitan Life Insurance Co. launched a wide-scale campaign to alert computer users to the impending dangers of the Jerusalem, Friday the 13th and other computer viruses that were set to go off on that fabled unlucky day.

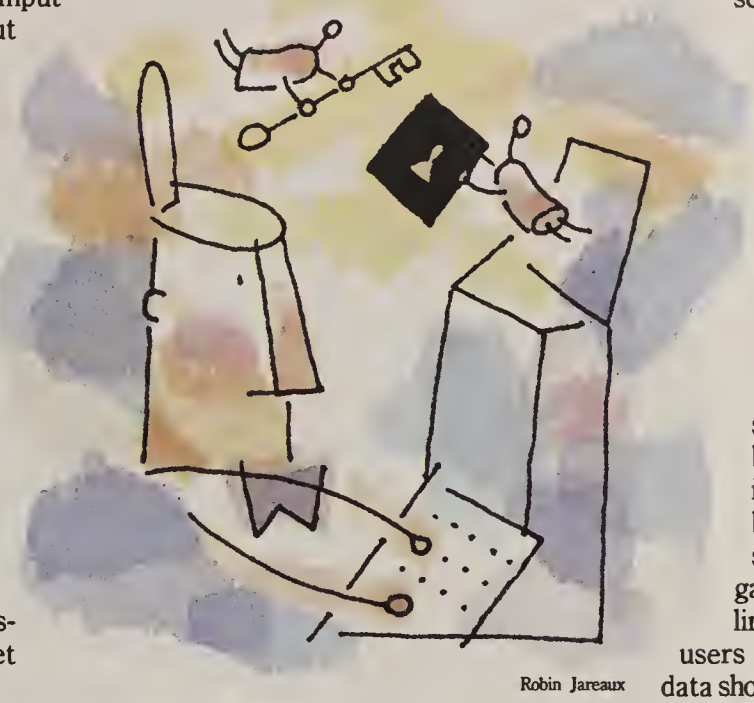
With 18,000 personal computers in-house and about 11,000 laptops in the field, Met Life had plenty of reasons to worry. However, when the day ended, only two PCs had been infected.

It is an extraordinary success story — one that is often overlooked these days when viruses are as common as colds but far more damaging. The main reason so few machines were hit was Met Life's ongoing computer security awareness program, says Fran Smyth, assistant vice president of information systems risk management at Met Life.

New York-based Met Life is one of a growing number of corporations that have orchestrated formal computer security awareness programs to instruct computer users on how to safeguard the integrity and confidentiality of corporate information.

Computer security awareness is a "topic whose time has finally come," according to Cathy Weyhausen Englishman, a member of the technical staff of the computer security group at AT&T Bell Laboratories in Murray Hill, N.J.

There has been "a dramatic change" in the number of companies introducing computer security awareness programs in recent years, but the topic of discussion is still "the new kid on the block," Englishman says.



Robin Jareaux

The key to a successful awareness program is to develop a multimedia campaign with a theme that fits the company's culture, she says. "You may want to plan a year at a time and maybe have four themes during the year," she says.

Increasingly, companies are turning to security units or councils, populated with users and managers from a variety of key organizations within the companies, to promote computer security awareness and help ward off viruses as well as other problems.

There are 40 members of the information systems security council at Eastman Kodak Co. in Rochester, N.Y. The council's mission is to create posters, flyers and other media and host computer security awareness seminars, says John Welsh, director of the IS security service at the company.

The council consists of "a mix of people, not just those who are totally focused on computer operations," Welsh says. "We are also linked to our technology development organization to get the security oar in the water as soon as new things are being developed in the company."

Most companies have basic security policies or building blocks in place before establishing a council, Welsh says. The basics, typically endorsed by senior management, cover a gamut of security issues, from limiting data access to authorized users to reminding users how often data should be backed up.

Getting the endorsement from management for the council's efforts is critical, he says. "The endorsement itself is what prompts most people to turn to us and say, 'Please come to talk to us about this,' " he says.

Corporations are using many techniques to promote computer security

Continued on page 90

IS in Europe continues to feel squeeze

BY ROSEMARY HAMILTON
CW STAFF

Like many U.S. information systems executives, European managers reported continued pressure to control costs because of tough economic conditions.

Nearly a third of European IS managers recently surveyed said their 1992 budgets will not increase from this year's spending level. Another 10% expect a decrease in next year's budget from 1991.

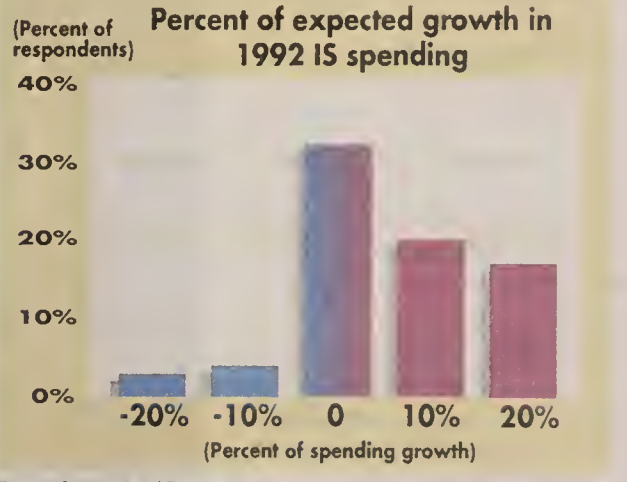
The survey, completed by International Data Corp.'s (IDC) European Research Center in London, was released at the European Information Technology Forum held in Venice late last month and sponsored by IDC. The results are based on 100 interviews with IS managers throughout Europe.

While the bulk of those surveyed said budgets would stay at current levels or be cut, another third of the respondents said they expect to increase spending by between 10% and 20%. This reflects the different degrees of economic doldrums in European regions, said Jim Beveridge, managing director of IDC's European Research Center.

"Visit Northern Europe, Scandinavia and the UK and your audience is depressed," Beveridge said. "Fifty percent of your audience is distracted, and they are worrying if they are going to have a job next year. Visit Central Europe, Austria, Germany and Switzerland, and people are buoyant."

Stagnation

Information systems spending in Europe is weak, with more than one-half of the surveyed user firms expecting little or no growth in 1992



Source: International Data Corp. CW Chart: Janell Genovese

The results also "dovetail the overall market," said Amit Chaudhuri, a research analyst at the European Research Center. Based on another IDC report completed in August, the Western European IS market is expected to grow by about 7.3% next year from the 1991 total of $108 billion.

Password

CONTINUED FROM PAGE 89

awareness, including the following:

• **Posters.** "Reflect your theme in different ways — recognize that people are attracted by different approaches," Englishman advises. "One person might love a cartoon, while another thinks that that is making light of the situation."

• **Booklets and flyers.** Publications for users may emphasize various aspects of security, such as how to protect against getting a virus and how to determine when a PC has been infected. The booklet or flyer will have greater impact if it is addressed and sent to each employee by internal mail rather than by merely dropping them on desks, Englishman adds.

• **Videos.** There are a variety of off-the-shelf, 10- to 15-min. videotapes that address computer security. There are enough of them out there that you can find ones that reflect your theme. Larger companies often opt to create their own videos. "Video is the state of the art," Englishman says. "If you don't have a video you don't rate because that is how you communicate nowadays."

• **Articles in company newsletters.** They may discuss computer security or publicize upcoming events organized to promote security.

• **Employee "trinkets."** Englishman advocates giving employees items such as pens, stickers and antistatic screen cloths — with a security message attached.

THE SPREAD OF personal computers and local- and wide-area networks in recent years has spawned a concern that corporate information is not as well protected as it once was when it resided in the data center.

There are several reasons for the growing interest in fostering computer security awareness in a full-fledged program, several corporate computer security chiefs say. First, the spread of personal computers and local- and wide-area networks in recent years has spawned a concern that corporate information is not as well protected as it once was when it resided in the data center.

Senior management is also taking a closer look at security because of both corporate and personal liabilities that may ensue if valuable information is lost or falls into the wrong hands.

"Computer security is directed very much toward the standard of 'due care,' which says whatever is appropriate or available in the same industry," Englishman explains. "Management is held responsible for at least implementing that level of security."

Met Life has been touting security to users for more than eight years, but it was not until it set up a "security awareness unit" about three years ago that the effort was formalized, Smyth says.

"There are five people in the unit, and they are charged with keeping aware of new developments, techniques, programs, products and with creating an ongoing awareness program," Smyth says.

Well-armored with security awareness

Even though employees were greeted by two knights in shining armor as they arrived for work at Met Life's New York headquarters on the morning of Sept. 27, it was business as usual at the life insurance company.

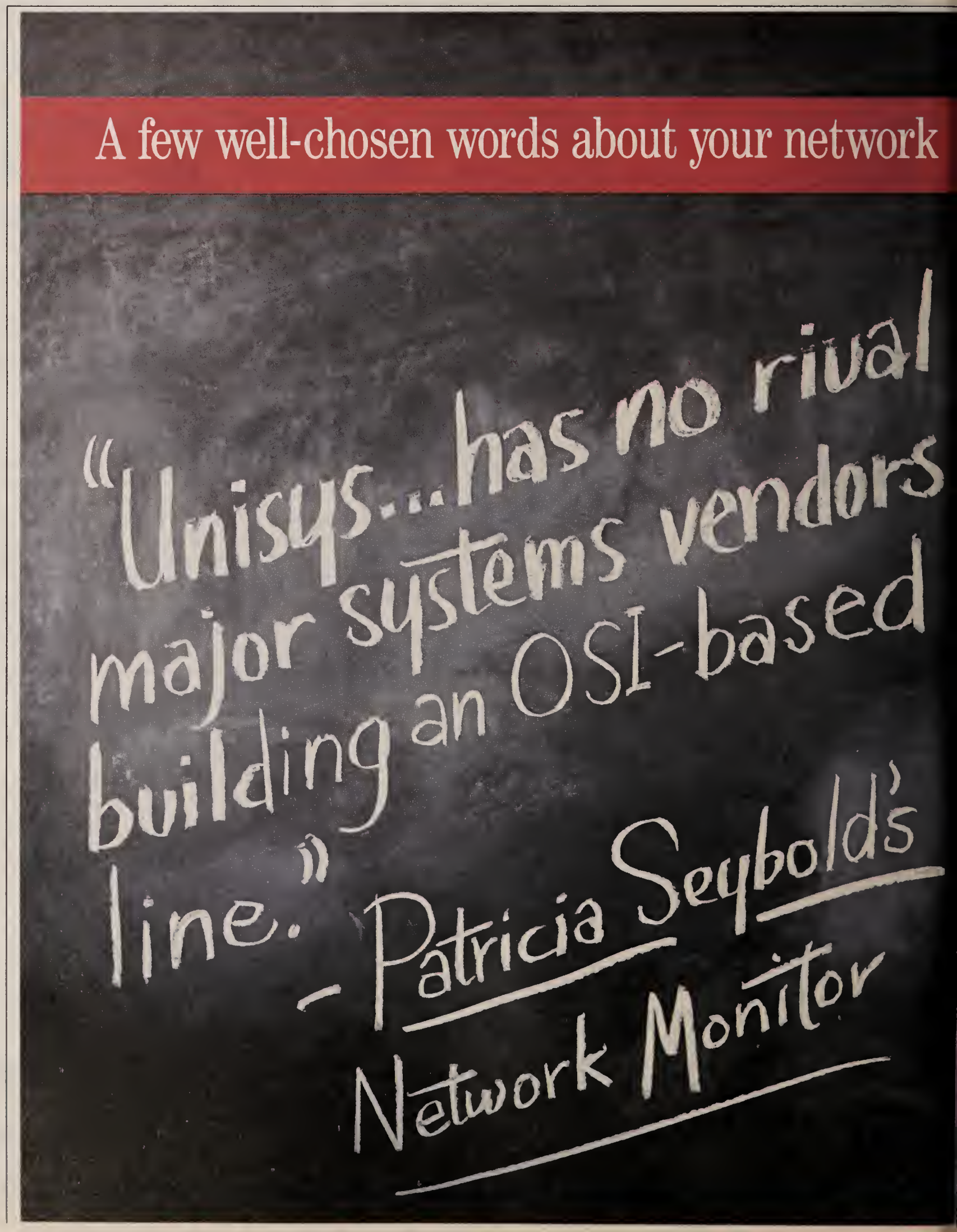
The knights handed out toothbrushes, affixed with the message: "Treat your computer password like your toothbrush — change it often and don't share it."

Met Life regularly sponsors computer security awareness days to educate its employees about the potential risks to a company's data. Most employees had already known from the posters in the elevators, articles in company newsletters and other publicity that this would be one such event — but the medieval motif was an unexpected creative touch.

Later that morning, employees attended a seminar in the company auditorium that included a presentation by computer security expert Winn Schwartau, author of *Terminal Compromise*, and the showing of videos about computer security. The presentation was videotaped and distributed to 10 locations across the country.

Employees also received computer security reference cards intended to be placed alongside their PCs and antiviral software. The company's officers received copies of *The Cuckoo's Egg* by Clifford Stoll, a speaker in an earlier computer security awareness seminar.

MICHAEL ALEXANDER



Bergstein leaves CSC for smaller firm, more excitement

BY CLINTON WILDER
CW STAFF

CHICAGO — While his former employer was announcing the General Dynamics Corp. megadeal that he helped consummate [CW, Sept. 30], consultant Melvyn Bergstein was already settling into his new company.

The outspoken Bergstein, who left Andersen Consulting two years ago to join Computer Sciences Corp. (CSC), recently joined small systems integrator Technology Solutions Corp. (TSC) here as executive vice president, the No. 2 position under founder and Chairman Al Beedie. Beedie, a former Arthur Young & Co. consultant, started TSC three years ago. TSC launched its initial public stock offering Sept. 20.

"CSC was a good company, but it's a big company," Bergstein, 49, said when contacted late last month. "The opportunity to get into a small, hot growth company at this stage of my career was irresistible. It's exciting as hell."

Rick Friedman

Bergstein: *'CSC was a good company, but it's a big company'*

TSC is a $50 million, 330-employee firm focusing on integration projects in the manufacturing, consumer products and financial services industries. Bergstein will initially concentrate on consumer products.

Bergstein can also remain closer to his home in the Chicago suburbs, which he continued to own as CSC senior vice president while working primarily out of the CSC Index offices in Cambridge, Mass.

MANAGEMENT SHORTS

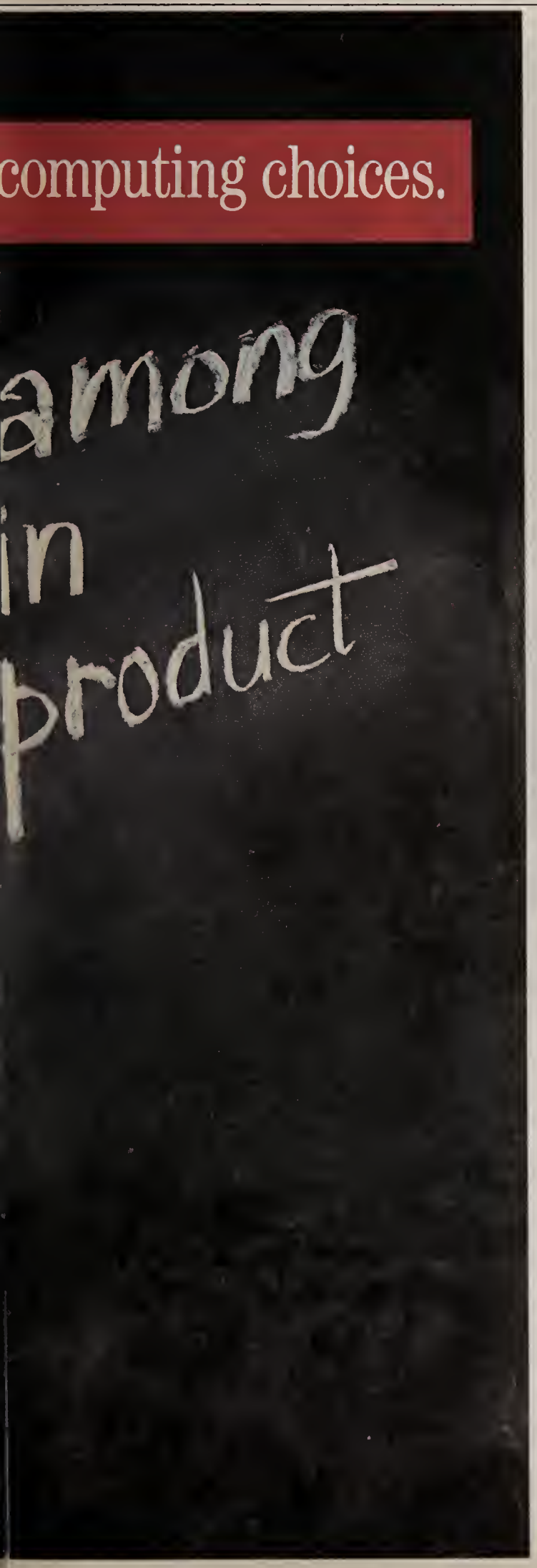
SIM honors L.A. students

The Southern California chapter of the **Society for Information Management** has awarded academic scholarships to six Los Angeles-area high school students. The students, all of whom attend California State University at Los Angeles, were selected for their academic excellence and interest in computer systems technology and data processing. "Each recipient displays outstanding talent and strength in the information technology area," said M. Victor Janulaitis, chapter chairman. Each student received a $500 grant. The winners were Humberto Gurrola and Rafael Moran of Garfield High School, Jose Robles of Bell High School, Cynthia Palacios of Roosevelt High School, Ariosto Salomon of Wilson High School and Joaquin Soto of Lincoln High School.

Computer Sciences Corp., right on the heels of its huge 10-year outsourcing contract with General Dynamics Corp. [CW, Sept. 30], announced a five-year pact to maintain and operate systems for the **Defense Information Systems Agency.** The contract is valued at $68 million if all options are exercised. CSC's Systems Engineering Division in Falls Church, Va., will oversee the systems that enable the Office of Secretary of Defense Dick Cheney and the Joint Chiefs of Staff to command and control military forces worldwide.

Susan Antonini of the city of Phoenix received the **Office Automation Society International's** (OASI) Grace M. Hopper Award for her paper describing the city's records imaging system. Richard J. Nees of Richard J. Nees Associates in Flemington, N.J., received the OASI's president's award, and Robert S. Emmel at Andersen Consulting in Chicago received the newly named Jackie S. Potts award.

The OASI also issued a call for papers for its conference, to be held June 7-10, 1992, in Cincinnati. Abstracts are requested on the topic "Answers to the Office Automation Society Jigsaw" and may include technologies such as electronic and voice mail, networking, optical storage and neural networks. Submissions are due Dec. 1 and should be mailed to OASI, P.O. Box 374, McLean, Va. 22101. The phone number is (703) 821-6650.



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COMMENTARY

Clinton Wilder

Ill wind for fate of IS?

"Through the management systems of measurement and compensation that they implement, executives send strong signals as to what is really important and what is not."
— Consultant Michael Hammer in the 1991 *Computerworld Premier 100*

As companies face the brutal challenge of making IS more effective in lean recessionary times, Hammer's question of "What is really important?" will be asked time and time again. For the future of IS implementation and management, I sincerely hope the answer will not always be, "Cutting costs and boosting the stock price."

General Dynamics' decision two weeks ago to contract its entire IS function to Computer Sciences is a momentous one. Whether it is the right decision can only be answered by the same measuring stick that applies to any long-term outsourcing pact: "Time will tell." But some of the company's motivations for entering such an agreement raise some potentially unsettling questions for the IS community.

General Dynamics was rated No. 1 in IS effectiveness in the aerospace industry by the *Computerworld Premier 100* for two straight years. But the $10 billion firm slipped considerably in this year's rankings, and a big reason was its $578 million loss in 1990 — the fifth largest deficit in the Fortune 500.

So when William A. Anders took over as chairman at the beginning of this year, he was a man on a mission. General Dynamics took a hard look at itself in a shrinking defense marketplace and decided it had to get smaller faster. The work force was slashed by about 15%, with 1,000 jobs cut in the Data Systems Division alone.

Anders also instituted a plan of incentives for senior executives, including IS chief Asaph Hall, that was tied directly to the company's stock price. The message was clear: Bottom-line, balance-sheet-oriented decisions — the kind that Wall Street loves — would be rewarded.

Anders' strategy has worked brilliantly. General Dynamics' stock, which has traded as low as $19 per share in the past year, reached a new high of $49.50 two days after the Computer Sciences deal was announced.

General Dynamics' situation cannot be applied to every company. According to Hall, the firm weighed the benefits of continuing to own and maintain a huge IS infrastructure, with an annual budget of more than $500 million, while the company itself was shrinking.

Hall also talked of the frustration of not being able to hire top-notch technology talent because of budget constraints. Finding and hiring good people is both more difficult and more important than ever for any IS shop, and Hall reasoned that Computer Sciences will be in a better position than General Dynamics to do that over the next 10 years.

Nonetheless, a red flag is raised by the implication that the IS infrastructure — people included — can become a liability. "Let's get it off the balance sheet" does not sound like a strategy for long-term competitive success with IS.

Business executives may respond, "Well, that sounds fine in theory. But we've poured millions into computers over the years, and where's the payback? Where's the value added? Those IS folks still talk to me in a language I can't understand, and I'm fed up. We're in a recession right now, and I've got a business to run."

Like it or not, those attitudes still prevail within hundreds of executive suites across the country. And you know what? Most of the time, they're absolutely right. Their IS executives have not successfully communicated their role and their benefits. In those cases, there are two attractive options: Either outsource or bring in a new IS chief.

In corporate climates such as this, the easiest way for an IS chief to get senior management attention — and praise — is to show bottom-line results. And because strategic or so-called soft benefits are virtually impossible to quantify with traditional accounting methods, IS expenses present an inviting target.

"Often it seems like the only way you can prove you're doing a good job in IS is to reduce costs," says Thornton May, a young consultant at Nolan, Norton & Co. In his inimitable style, May calls this the "Conan the Technologist" approach.

In order for companies to achieve IS success in the '90s, the business and IS sides of the house must meet each other halfway. IS certainly must keep costs under control, resist technology for technology's sake, focus on the most cost-effective approaches — and even outsource pieces of the operation if it makes sense.

But business leaders must also realize that there is more to long-term global market competition than balance sheets and stock movements. The strategic use of information should never be relegated to secondary status.

Wilder is *Computerworld*'s senior editor, management.

CALENDAR

The American Gas Association/Edison Electric Institute will hold their 39th Information Systems Conference Nov. 3-6 at the Westin Bonaventure hotel in Los Angeles.

Focusing on the use of IS in the utilities industries, the conference features tracks in applications development, applications, operations, technical environment and management/strategic issues. Most sessions feature IS professionals from utility companies presenting case studies and real-world experiences.

For more information or to register, contact Jeffrey Kirstein, Edison Electric Institute in Washington, D.C., at (202) 508-5433.

OCT. 27-NOV. 2

Building the HRM Data Model. Arlington, Va., Oct. 28 — Contact: Association of Human Resources Systems Professionals, Dallas, Texas (214) 661-3727.

The Hammer Re-engineering Conference. Boston, Oct. 28-30 — Contact: Hammer Forum, Cambridge, Mass. (617) 354-5555.

Electronic Messaging '91: Taking Care of Business. New Orleans, Oct. 28-30 — Contact: Electronic Mail Association, Arlington, Va. (703) 875-8620.

CMC '91 and A/E/C Systems. Nashville, Oct. 28-31 — Contact: Kelly Baxter, A/E/C Systems, Chadds Ford, Pa. (215) 444-9583.

Symposium '91. Lake Buena Vista, Fla., Oct. 28-Nov. 1 — Contact: Ashley Pearce, Gartner Group, Inc., Stamford, Conn. (203) 967-6757.

New Media in the '90s. Boston, Oct. 29 — Contact: Judy Tampa, Media Sense, Inc., San Francisco, Calif. (415) 441-2944.

Token Ring LAN Bridges & Routers. Sea Girt, N.J., Oct. 29-30 — Contact: Virtual Systems of New Jersey, Sea Girt, N.J. (908) 449-7999.

1991 Marketing Conference. New York, Oct. 29-30 — Contact: The Conference Board, New York, N.Y. (212) 339-0290.

The Third Annual Conference & Exposition on Disaster Recovery and Business Resumption Planning. Atlantic City, Oct. 30-Nov. 1 — Contact: Jack Bannan, Delaware Valley Disaster Recovery Information Exchange Group, Inc., Cherry Hill, N.J. (609) 778-5702.

Unix Expo International. New York, Oct. 30-Nov. 1 — Contact: National Blenheim Expositions, New York, N.Y. (212) 391-9111.

CD-I One Conference and Exhibition. Los Angeles, Oct. 31-Nov. 1 — Contact: Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

IS Forum: Technology for the '90s. Fremont, Calif., Nov. 1 — Contact: Jay Kamlani, Jay Mark Applied Systems, Inc., Fremont, Calif. (415) 651-6030.

NOV. 3-9

User Services Conference. Seattle, Nov. 3-6 — Contact: Sheryl Burgstahler, University of Washington, Seattle, Wash. (206) 543-0622.

Aspenworld '91. Cambridge, Mass., Nov. 3-6 — Contact: Aspen Technology, Inc., Cambridge, Mass. (617) 497-9010.

12th Annual Data Training Conference & Exposition. Atlanta, Nov. 3-7 — Contact: Conference Department, Boston, Mass. (617) 542-0146.

Decision Support and Executive Information Systems: A Managerial Perspective. Cambridge, Mass., Nov. 4-5 — Contact: Decision Support Technology, Inc., Cambridge, Mass. (617) 354-6400.

Association for Services Management (AFSM) International's Eighth Annual Senior Executive Conference. Edinburgh, Scotland, Nov. 4-6 — Contact: AFSM International, Fort Myers, Fla. (813) 275-7887.

Infotech Management Conference & Exposition. New Orleans, Nov. 4-6 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

Voice '91/Fall. New York, Nov. 4-7 — Contact: Voice '91/Fall, Houston, Texas (713) 974-6637.

Downsizing/Rightsizing Corporate Computing. Washington, D.C., Nov. 4-7 — Contact: Todd Langton, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

C-Forum '91. Boston, Nov. 4-8 — Contact: The Wang Institute of Boston University, Tyngsboro, Mass. (508) 649-9731.

Texas Arc/Info User Group. Denton, Texas, Nov. 4-8 — Contact: Scott Sires, Texas Arc/Info User Group, Denton, Texas (512) 475-0334.

Entity Modeling: Techniques and Applications. Houston, Nov. 4-8 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

The Mac Show. King of Prussia, Pa., Nov. 5-6 — Contact: Ad-Libs Advertising, Dresher, Pa. (215) 540-9111.

Scon Tech '91. Dallas, Nov. 5-7 — Contact: Automatic Identification Manufacturers USA, Pittsburgh, Pa. (412) 963-8588.

Broadband Networks. Washington, D.C., Nov. 5-8 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Canadian Information & Image Management. Toronto, Nov. 6-7 — Contact: World Access Corp., Wellesley Hills, Mass. (617) 235-8095.

Fourth Annual Microprocessor Forum. Burlingame, Calif., Nov. 6-7 — Contact: Microprocessor Forum, Berkeley, Calif. (510) 549-4300.

DB2 Detail Conference. New York, Nov. 6-7 — Contact: George Coronado, DB2 & SQL Users Group, New York, N.Y. (212) 866-7563.

London '91. Atlantic City, Nov. 7-9 — Contact: Local-area Network Dealers Association, Elmhurst, Ill. (708) 279-2255.

NOV. 10-16

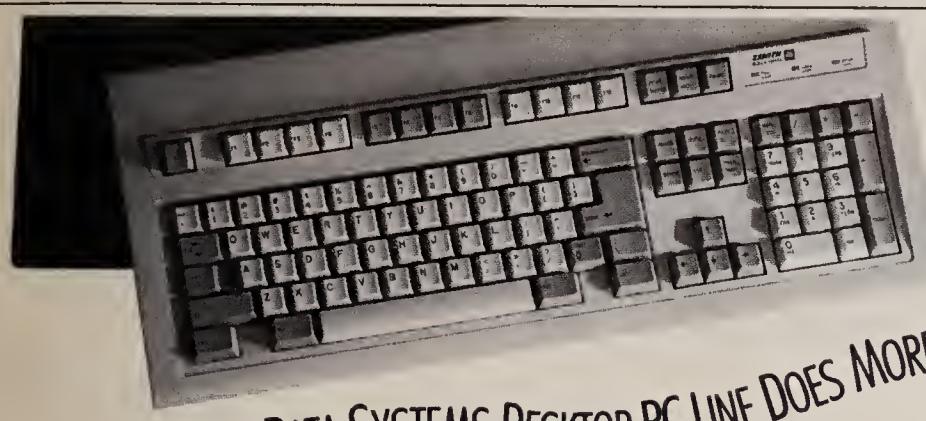
Managing Apple Computers in Information Systems. Phoenix, Nov. 10-13 — Contact: Managing Apple Computers in Information Systems, Chicago, Ill. (312) 644-6610.

The East-West High-Tech Forum. Warsaw, Poland, Nov. 10-13 — Contact: Edventure Holdings, Inc., New York, N.Y. (212) 832-1720.

North American Telecommunications Association Unicom '91. Washington, D.C., Nov. 11-14 — Contact: Allan M. Olbur, Comserv, Inc., Glenview, Ill. (708) 657-9000.

Windows. Boston, Nov. 11-15 — Contact: The Wang Institute of Boston University, Tyngsboro, Mass. (508) 649-9731.

Society Of Manufacturing Engineers Autofact '91. Chicago, Nov. 12-14 — Contact: Diana Campau, The Society of Manufacturing Engineers Event Public Relations, Dearborn, Mich. (313) 271-0777.



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Microprocessor	i386™SX – 20/10 MHz	i486™SX – 20 MHz	i486DX – 33 MHz	i486DX – 33 MHz	i386SX – 16 MHz
Co-Processor	Optional 80387SX	Weitek 4167 socket i486DX upgrade	Weitek 4167 socket	Weitek 4167 socket	Optional 80387SX
Memory (Std./Board Max.)	2MB/16MB	4MB/32MB	4MB/64MB	BMB/64MB	1MB/BMB
Expansion Slots	4 open 16-bit ISA	3 open 32-bit EISA	3 open 32-bit EISA	B open 32-bit EISA	2 open 16-bit ISA
Hard Disk Drive	40MB or 80MB IDE	80MB or 200MB IDE	200MB or 400MB IDE	340MB half-height SCSI; 6 open half-height bays	Diskless, 40MB IDE optional
Ports	2 serial, 1 parallel	2 serial, 1 parallel	2 serial, 1 parallel	2 serial, 2 parallel, 1 mouse	2 serial, 1 parallel
Disk Drive Controller	Combined IDE connector/ floppy controller	Combined IDE connector/ floppy controller	Combined IDE connector/SCSI/ floppy controller	EISA bus master SCSI mass host adapter	IDE connector/ floppy controller
Video	16-bit VGA card	16-bit VGA card	TIGA/VGA	16-bit VGA card	16-bit VGA on board
LAN Features				Optional RAID 5 disk array software	Dual level ROM-based password protection

Z-486/33E

Z-486/33ET and Z-LS

Novell Labs Tested & Approved

*The Z-486/33ET has been tested for compatibility with Novell NetWare® and Microsoft LAN Manager.™ The Z-486/33ET has been submitted for testing and compatibility with Banyan® VINES™ and SCO™ and ISC™ UNIX®

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September 11, 1991

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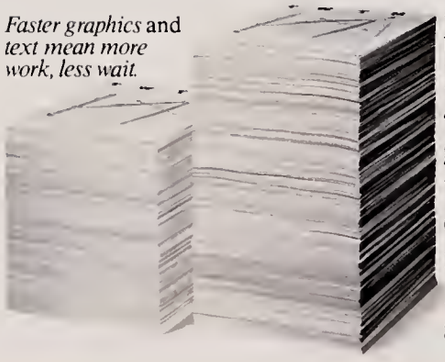
In the time it takes the HP LaserJet III to print this much...

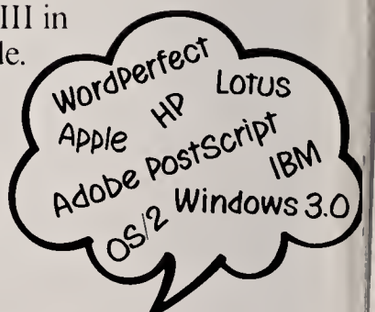
As you can see, this is a printer with legs. In fact, for the new IBM® LaserPrinter 10, 45% faster graphics is just a warmup. Shift into optional PostScript® mode, and the LaserPrinter 10 is a full two-and-a-half times as fast as the LaserJet III in PostScript mode. And those are just averages. The more complex your page, the more time you save.



Faster graphics and *text mean more work, less wait.*

Our 68020 processor and high-speed ports leave the other guys in the dust.

At the heart of the new LaserPrinter 10, a Motorola 68020 processor makes short work of tough graphics.



The new LaserPrinters definitely speak your language.

THE NEW IBM LASERPR

new IBM LaserPrinter 10 of the other guy.

...the IBM LaserPrinter 10 gives you the whole picture.

A 10-page-per-minute print engine boosts speed further, so even plain text prints 25% faster than the LaserJet® III. High speed ports accept data up to 15 times faster, too, to unjam LANs and keep people working, not waiting.

If you're wondering how all this speed fits into your system, don't. Every new IBM LaserPrinter has three built-in data streams, *including* built-in HP LaserJet II emulation. There are drivers from the major software makers, and LaserJet III emulation and Adobe® PostScript are optional. So LaserPrinters save you not just time, but headaches.

The IBM LaserPrinter 10, one of four new LaserPrinters.

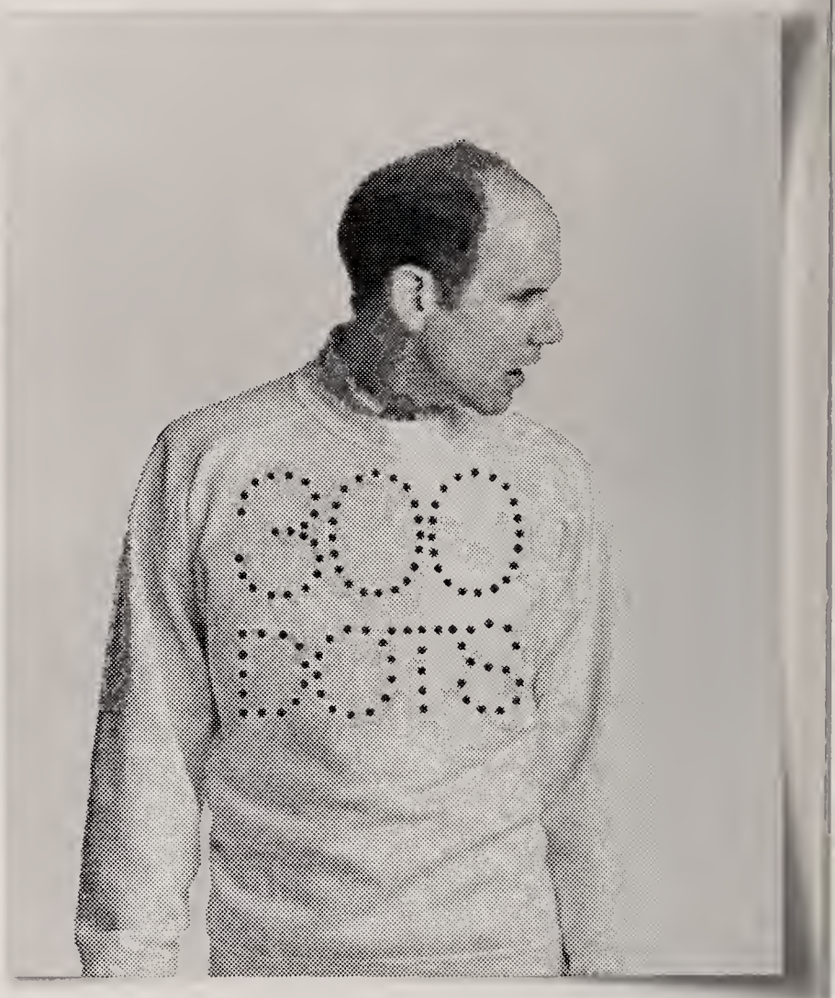
There's a whole family of new IBM LaserPrinters, designed to outrun the competition in print quality, paper handling, and more. So keep your eyes on the next few pages. You'll see how the new IBM LaserPrinters put you precisely where you want to be: ahead.

Graphics speed comparisons based on captured, compressed image data files. PostScript files sourced from Microsoft® Soft Print® test case, running files captured from output of application drivers.

I N T E R S. P A G E S A H E A D.

At 600 x 600 dpi, the
does wonders for any

HP LaserJet III
with PostScript option:
300 x 300 dpi, max.



Courier
Courier Oblique
Courier Bold
Courier Bold Oblique
Times New Roman
Times New Roman Italic
Times New Roman Bold
Times New Roman Bold Italic
Helvetica
Helvetica Italic
Helvetica Bold
Helvetica Bold Italic
Helvetica Narrow
Helvetica Narrow Italic
Helvetica Narrow Bold
Helvetica Narrow Bold Italic

Times
Times Bold
Times Italic
Times Bold Italic
Univers
Univers Bold
Univers Italic
Univers Bold Italic

Sixteen scalable fonts, built in—twice as many as an HP LaserJet. And our fonts are Type-I. Theirs aren't.

There's no end to the ways the new IBM LaserPrinters can make a body look good.

For starters, there's an Adobe PostScript option that delivers a true 600 x 600 dots per inch. It gives you up to *four times* the resolution of PostScript on any HP LaserJet. Camera-ready output, on your desktop, for thousands of dollars less than ever before.

But the eye-catching advantages of the new IBM LaserPrinters

LaserJet

IBM

HP LaserJet jump-gap toner system vs. our contact-transfer. A clean win for the IBM LaserPrinter. (10x enlargement.)

300 x 300 dpi PostScript optional on all LaserPrinter models; requires total of 2MB memory. Models 6, 10 and 10L upgradable to 600 x 600 dpi PostScript; requires total of 5MB memory. Motorola and the Motorola logo are registered trademarks of Motorola, Inc. WordPerfect is a registered trademark of WordPerfect Corporation. Windows 3.0 is a registered trademark of Microsoft Corporation. Lotus is a registered trademark of Lotus Development Corporation.

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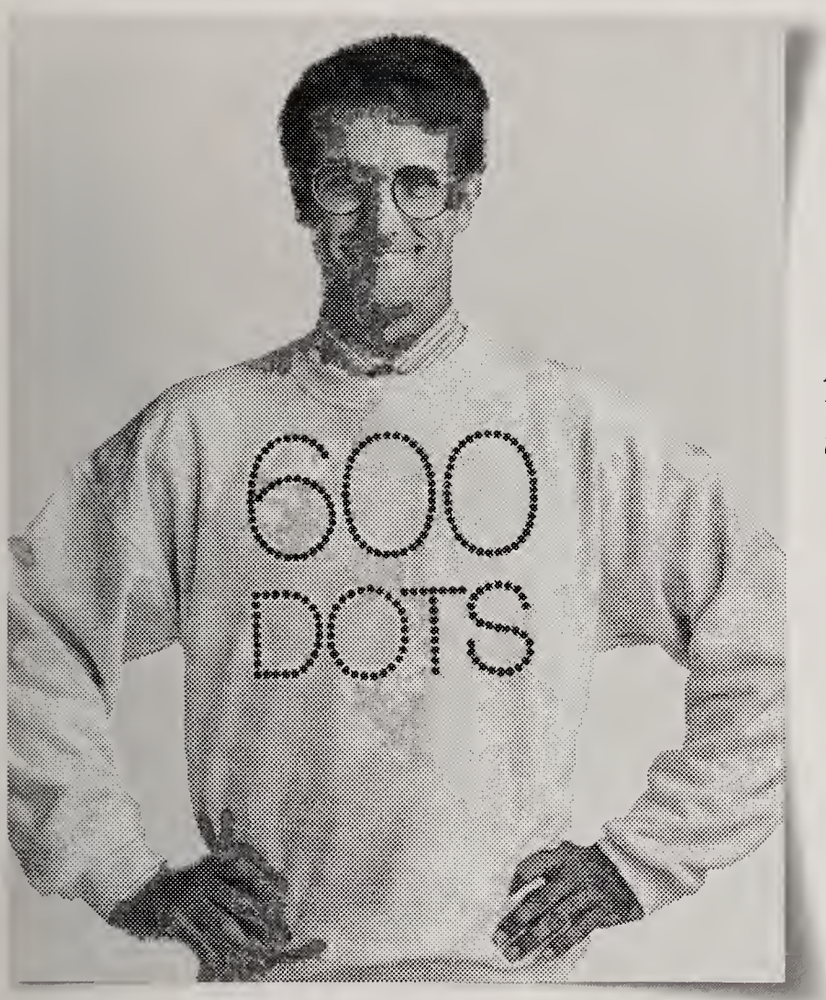
Image. Especially yours.

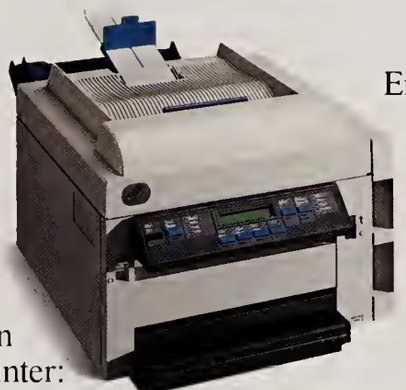


IBM LaserPrinter
with PostScript option: 600 x 600 dpi—
up to four times the resolution.

aren't reserved just for PostScript users.

Sixteen built-in scalable fonts are standard equipment—twice as many as the LaserJet III. They're Type-1 fonts with Adobe scaling technology, online and always ready, without waiting for downloads.

Also standard on every new LaserPrinter: crisper type and graphics than ever, thanks to sophisticated new Print Quality Enhancement Technology (PQET). There's more precise toner transfer than any LaserJet, and finer line weights. And fast, easy control-panel settings no LaserJet offers, for light/normal/dark print, and smooth or rough paper settings.



The new IBM LaserPrinters: the leading edge, made sharper.

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LaserJet RET *IBM PQET*

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HP LaserJet III: 200-sheet limit; second tray or larger tray options not available.

HP LaserJet III: sorry, one tray at a time.

IBM LaserPrinter: up to three trays at once, for automatic collating.

For an antidote to everyday office stress, try the superb paper-handling options of the new IBM LaserPrinters.

Most models can use three paper trays at once, automatically. So you can print and collate letterhead, second sheets and envelopes, without swapping trays.

Envelope Conditioning on Models 10 and 10L fights unsightly wrinkles.

Need expertise with envelopes? No leading laser printer even comes close to the IBM LaserPrinters. They adjust print weight automatically when an envelope is fed in. Our optional 75-envelope feeder holds five times as many as the LaserJet III tray.

Optional trays smoothly handle card stock, labels, overheads.

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he new IBM LaserPrinter
ot reload.

IBM LaserPrinter: 700 pages without reloading, using optional 500-sheet second tray.

Zero-footprint, 500-sheet second tray is standard on the Model 10L, optional on Models 6 and 10.

nd on the LaserPrinter 10 and 10L, ur exclusive Envelope Conditioning ghts wrinkling.

There's a special optional tray for eavy card stocks and labels, and a ront exit to keep them flat.

And along with all this efficiency, here's economy. "Smart" paper trays djust to multiple paper sizes, unlike LaserJet rays. Trays are interchangeable among LaserPrinter models, again unlike the LaserJet.

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In short, the new IBM LaserPrinters give you economy and paper handling the competition can't touch. With this kind of work-hungry, cost-conscious office help, you can actually afford to relax.

0-sheet tray and front exit not available on Model 5E.

N T E R S. P A G E S A H E A D.

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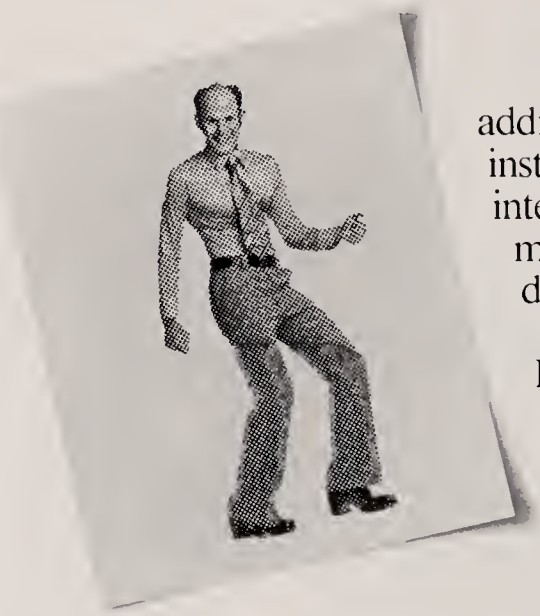
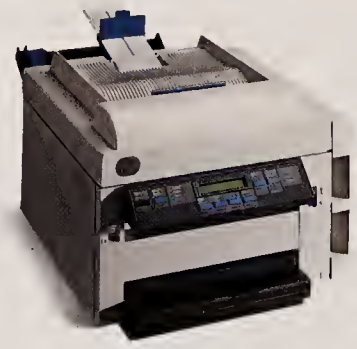
No matter how quickly your printing needs change, the new IBM LaserPrinters can change with them. Any six-page-per-minute machine can be easily upgraded to a full 10 pages per minute. Auxiliary trays can be added any time, and moved quickly from machine to machine, or from model to model. Adobe PostScript upgrades and additional memory are easy to install yourself, in minutes, and are interchangeable among LaserPrinter models. And one toner cartridge design fits every LaserPrinter.



Modular design means IBM LaserPrinters are uniquely qualified to deal with the business world's one certainty: uncertainty.

***LaserPrinter** 10L—10 ppm, Motorola 68020 16.7 MHz, 700-sheet input, 250-sheet output, Envelope Conditioning, automatic emulation switching. $2995 suggested retail. Optional: 75-envelope tray, Adobe PostScript 600 x 600 dpi, HP PCL5 emulation.*



***LaserPrinter** 10—10 ppm, Motorola 68020 16.7 MHz, 200-sheet input, 100-sheet output, Envelope Conditioning. $2395 suggested retail. Optional: 500-sheet paper tray, 75-envelope tray, Adobe PostScript 600 x 600 dpi, HP PCL5 emulation.*

***LaserPrinter 6**—6 ppm, 200-sheet input, 100-sheet output. $1895 suggested retail. Optional: upgrade to 10 ppm, 500-sheet paper tray, 75-envelope tray, Adobe PostScript 600 x 600 dpi, HP PCL5 emulation.*

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Printers this productive deserve to be shared, and a host of networking options makes it easy. For Ethernet™ or Token-Ring LANs, there's the IBM 4033 LAN connection for OS/2® and AIX® users. For Macintosh users, there's the IBM LaserPrinter Option for AppleTalk® Networks, and for Novell® NetWare® environments, the NetPort® print server from Intel.® Network-ability is one more way the new IBM LaserPrinters put you ahead, and keep you there.

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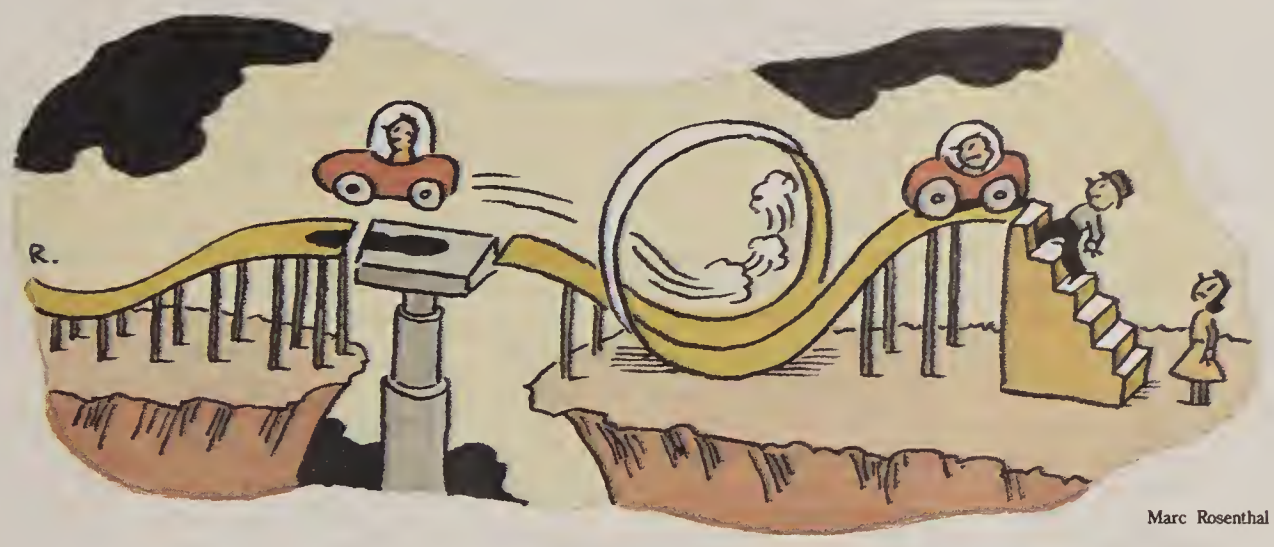
THE NEW IBM LASERPRINTERS.

TCP/IP

Effective, yes. Well supported, definitely. But if you're looking for a graceful way to link PCs to hosts, you'd better wait a while

BY SHARON FISHER



Marc Rosenthal

There's an old saying about a waltzing bear that also applies to today's implementations of Transmission Control Protocol/Internet Protocol (TCP/IP): The astounding thing is not how gracefully it performs but that it performs at all.

Somewhat clumsy but effective: This is what people have expected TCP/IP to be, and that's understandable, considering the acrobatics entailed in its job description. What else can you expect from a set of protocols intended to impose a common language on diverse machines and networks in order to get them to communicate?

Because so many people need to connect diverse computers — not to mention that this protocol set has garnered a lot of support from major vendors — TCP/IP has grown pretty popular. Estimates vary, but it's safe to say that there are 12,000 to more than 30,000 subnets with TCP/IP implemented, with each subnet containing dozens of computers of any type.

> THE TRUTH IS, TCP/IP takes some getting used to. There's more to communications than simply having compatible protocols.

TCP/IP is not for everyone, however, especially now that personal computers have entered the scene. Many corporations are now looking at using this protocol to link their PC local-area networks into the rest of the enterprise to hosts from the likes of IBM and Digital Equipment Corp. or to Unix-based servers.

This is certainly not impossible, but anyone who has installed TCP/IP has a story to tell, whether it's incompatibilities among vendor implementations, the difficulty of finding the right interface products for the different environments or the problems it can cause users, who must get used to a whole new operating environment.

Such complaints have set vendors scrambling to create TCP/IP software for PCs that quells what have been seen as TCP/IP deficiencies (see story page 98).

The truth of the matter is, TCP/IP requires some getting used to. While the protocols interoperate well between machines, there's more to communications than simply having compatible protocols, especially when other types of PC networks are already in place.

Implementing a TCP/IP protocol stack on the PC does allow it to exchange files via the File Transfer Protocol (FTP), log on to a computer remotely via the Telnet protocol and (in some cases) exchange electronic mail with other systems that also support TCP/IP via the Simple Mail Transfer Protocol (SMTP).

Of the two dozen or so vendors selling TCP/IP PC software, only some support SMTP, including Frontier Technologies Corp., FTP Software, Inc., Sun Microsystems, Inc., Netmanage, Inc. and Wollongong Group, Inc. Each vendor (with the exception of Novell, Inc., which offers a TCP/IP protocol stack under Netware 3.11) supports Telnet as well as FTP.

What TCP/IP doesn't do is provide all of the features that users are accustomed to in DOS. Users familiar with the wide variety of applications that can run over network operating systems may be disappointed by TCP/IP's lack of similar support.

Not only is there less application variety, but those familiar with a PC network operating system may also find TCP/IP applications a bit primitive.

"There are just beginning to be print services that are as good as Netware — or even half as good," says Dan Lynch, president of Interop, Inc., a Mountain View, Calif.-based organization that sponsors educational conferences in interoperability.

For example, there is no coordinated print service protocol, meaning each TCP/IP package may perform this service differently. The lack of a standard print service also inhibits the ability to control access to network printers.

The basic applications — E-mail, file transfer and remote log-on — are pretty well standardized from vendor to vendor. However, the application programming interfaces (API) are not, says Tim Sesow, general manager of network software at SSDS, Inc., a systems integrator in Littleton, Colo.

With nonstandardized APIs, two TCP/IP-linked systems on the network can communicate in terms of raw data, but the applications that run on top of them may not.

Novell is one vendor that has worked to solve this problem. Its TCP/IP protocol stack under Netware 3.11 supports standard Unix application interfaces such as Berkeley's sockets and AT&T's Streams.

NFS and interfaces

One application garnering support among TCP/IP software vendors is Network File System (NFS), which allows users to access files residing on Unix systems. NFS is also able to access files on mainframes. Frontier, FTP, Sun, Wollongong, Novell and Beame & Whiteside Software Ltd. offer NFS support.

One disadvantage of Sun's PC NFS is that it requires substantial memory, and users can't

Continued on page 98

Fisher is a San Francisco-based freelance writer specializing in data communications.

INSIDE

Planning for OSI
Four ways to prepare your network for some level of OSI. Page 99.

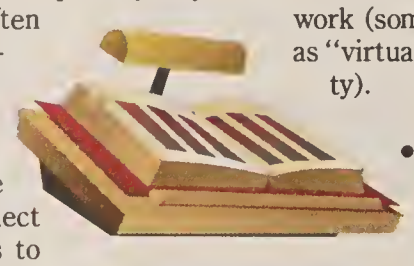
Voices of Experience
TCP/IP users share their trials and tribulations. Page 103.

Product Guide
A listing of PC-based protocol stacks and applications. Page 106.

A working definition

As the name implies, Transmission Control Protocol/Internet Protocol stands for two separate protocols.

While they are occasionally referred to separately (especially IP), they're more often grouped together and actually consist of more than a half-dozen protocols.



IP is a Layer 3/Network Layer protocol on the Open Systems Interconnect model, and its function is to connect networks, creating an "internet," which is a network composed of more than one subnetwork.

TCP, a Layer 4/Transport Layer protocol, runs on top of IP and provides reliable, end-to-end communications between two different machines on the internet.

One of the major differences between the two is that TCP is "reliable" and IP is "unreliable" — which doesn't mean that it fails often but rather that it doesn't guarantee that a packet of data gets delivered. That's TCP's job.

In addition to these two protocols, the term "TCP/IP" generally also refers to three Layer 7 applications programs, including the following:

- FTP, or file transfer protocol, which allows users to exchange files between two machines on a TCP/IP network.
- Telnet, or the ability to log on remotely to another machine on a TCP/IP network (sometimes also known as "virtual terminal" capability).
- SMTP, or Simple Mail Transfer Protocol, which provides very basic electronic mail links between two machines on a TCP/IP network.

Another application commonly associated with TCP/IP is NFS, or network file system. NFS is a method of storing files that allows heterogeneous computers to read them. NFS was originally designed for Unix systems but is now available for almost every type of hardware and operating system.

SNMP, or Simple Network Management Protocol, is another protocol associated with TCP/IP. Basically, SNMP is a standard way for devices to report and collect data about problems on the network.

SHARON FISHER

TCP/IP

CONTINUED FROM PAGE 97

unload it when they need the memory on their PCs; rather, they have to reboot the machine.

When people choose TCP/IP, they can't always expect a warm and fuzzy user interface. The software will allow users to transfer files, but it may use an interface that's more like Unix than DOS.

Vendors are working to improve interfaces, however. Locus Computing Corp.'s PC Interface, for instance, allowed users at Franklin Mortgage Capital Corp. in McLean, Va., to link PCs with Unix workstations without learning how to use Unix or a new interface, says Daniel Graifer, senior vice president of financial systems at the company. "PC NFS was available, but what I saw didn't look DOS-like to the DOS user," he says.

In an effort to create a friendlier user interface, many TCP/IP software vendors are building in Microsoft Corp. Windows support, with varying degrees of success. In tests run by a technical staff member at a major research organization, all of the applications resulted in "unexpected application exceptions" under Windows. The products analyzed included Netmanage's Chameleon, FTP Software's PC/TCP, Frontier's SuperTCP, Distinct Corp.'s Distinct TCP and a public domain package.

While some TCP/IP vendors are working to create true Windows applications, others are merely allowing DOS applications to run in a window.

FTP Software has confirmed that it will provide Windows support by the end of the year, while Frontier, Netmanage, Wollongong, Novell (through its LAN Workplace for DOS product) and Beame & Whiteside all say they support Windows now. Sun's PC NFS supports TCP/IP applications under Windows only as a full-screen DOS application.

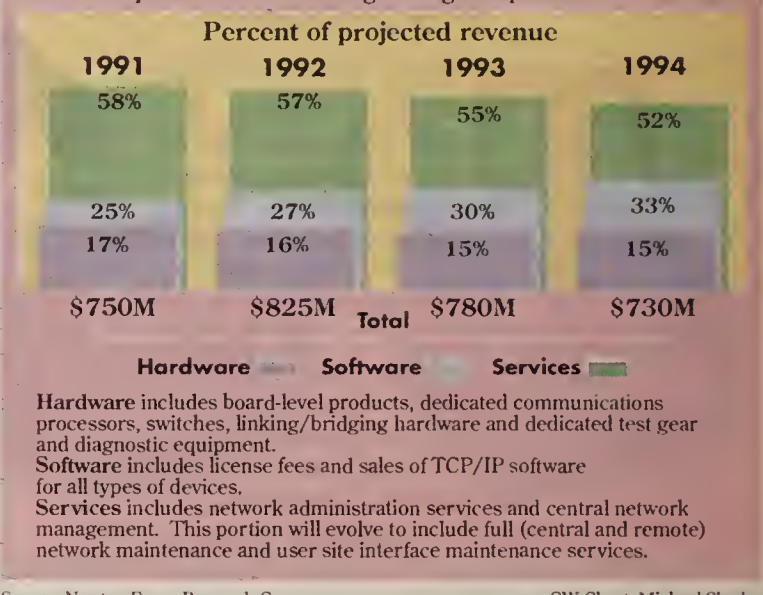
But just because you get Windows support doesn't mean you've got it all. To fulfill users' needs for both NFS and Windows, SSDS' Sesow had to purchase two TCP/IP software packages. Some users run PC NFS, with Telnet in a full window under DOS, and people who need Windows run Netmanage's Chameleon.

Compatibility with other, non-TCP/IP-based applications is another problem associated with TCP/IP. Pacific Bell, the Northern California telephone company, runs mail, file service and office automation software applications on its TCP/IP backbone, which links an IBM mainframe, a Sequent Computer Systems, Inc. minicomputer and 75 PCs over a thin-wire Ethernet network.

But it had to give up its Sequent-based

Service expenditure

Total TCP/IP spending is expected to slow down after 1992, but services expenditures will be a growing component



Hardware includes board-level products, dedicated communications processors, switches, linking/bridging hardware and dedicated test gear and diagnostic equipment.
Software includes license fees and sales of TCP/IP software for all types of devices.
Services includes network administration services and central network management. This portion will evolve to include full (central and remote) network maintenance and user site interface maintenance services.

Source: Newton-Evans Research Co. CW Chart: Michael Siggins

Product highlights

In the increasingly crowded TCP/IP software marketplace, personal computer software vendors are being forced to differentiate their products. Here is a sampling of where some vendors claim to stand out:

- Frontier Technologies claims the most comprehensive Windows support and the ability to support simultaneous TCP/IP and Open Systems Interconnect stacks for future migration.
- Beame & Whiteside's implementation is said to be one of the smallest and fastest.
- DEC's Pathworks products promise to bring the full set of DEC's networking capabilities to PCs through industry and de facto standards.
- FTP Software offers more applications that run on top of TCP/IP than other vendors, such as a number of Unix-based applications and the ability to act as both a server and a client.
- IBM's TCP/IP for DOS claims broad and thorough function, competitive price/performance ratio, easy installation and complete documentation.
- Netmanage says it is the only vendor to offer a Windows dynamic data link library, which lets users have up to 32 concurrent TCP/IP sessions.
- Novell's TCP/IP protocol stack under Netware 3.11 supports standard Unix application interfaces such as Berkeley sockets and AT&T's Streams. Its LAN Workplace for DOS implementation supports Netware's IPX transport protocols over TCP/IP and offers Windows support.
- Sun claims best performance and documentation.
- Walker, Richer & Quinn claims many types of terminal emulation.
- Wollongong's claim to fame is its wide range of implementations — for OS/2, Apple Computer, Inc.'s Macintosh, minicomputers, mainframes and DOS — making it easier to use for people who switch between machines.

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Office Power application because the minicomputer supports only some TCP/IP implementations, says Richard Perlman, information systems manager.

Similarly, TCP/IP purchasers need to make sure their vendor's SMTP implementation works with the E-mail package already in use on the PC network.

"Everybody's using SMTP, but they may have to be going through CC:Mail or Quickmail or Lotus Notes," Lynch says. "The user will care about the interface between the local mail system and the SMTP system."

Even if two machines support TCP/IP, there is enough variation in different vendors' protocol stacks that some implementations are not compatible with others.

At Franklin Mortgage, the Sequent Unix minicomputer that Graifer is now using for a database machine doesn't support PC Interface, meaning that the PC users need to continue getting their file transfer from the organization's installed base of Prime minicomputers.

Compatibility is also important at the driver level. Drivers act as the go-between for the network adapter and the PC communications software. PC network interface cards typically support drivers written specifically for them as well as up to three standard drivers, including 3Com Corp.'s NDIS, Novell's ODI and the public domain packet driver specification.

The driver used in the TCP/IP implementation must support the network adapter as well as be compatible with the other communications applications in use.

In other words, you can't have a TCP/IP implementation that supports the NDIS driver and a network operating system that uses an ODI driver.

Who supports what?

Frontier and Beame & Whiteside support NDIS and the public domain specification; FTP and Wollongong support NDIS, ODI and the public domain specification; Sun, Netmanage and Walker, Richer & Quinn, Inc. support NDIS; and Novell's Netware 3.11 and LAN Workplace for DOS support ODI.

On top of all the effort that goes into implementing TCP/IP, people still talk about the eventual dominance of Open Systems Interconnect and the importance of planning an eventual transition.

Most people forecast the waning of TCP/IP's popularity in the next few years. However, TCP/IP has gained a strong foothold in corporations today. TCP/IP is what corporations use now, and as anybody who's tried to pry 640K 8088-based PCs out of corporate users' hands knows, inertia is a powerful force. •

Parts for assembly

To connect a PC network to an enterprise network using TCP/IP, several pieces are required:

- Hardware to link the PC network to the enterprise network, most likely a router.
- TCP/IP "client" software, either on the individual PCs or on the server to be shared by the PCs. This software may be an application that provides just TCP/IP support, or it may incorporate support as part of a larger product, such as Novell's TCP/IP support in Netware 3.11.
- TCP/IP "server" software on the Unix workstations, minicomputers or mainframes.
- Drivers that allow the PC TCP/IP software to communicate with the network adapter cards in the PCs.
- Network management.

Your current PC network plays a large role in deciding the type of router and TCP/IP software you choose. The router needs to support whatever type of network the PC is on, as well as the media linking the LAN to the enterprise network, be it Ethernet, Fiber Distributed Data Interface or a wide-area network.

Routers also need to support all of the protocols used in the organization. Appropriate routers are most plentiful for Ethernet-based environments but are starting to appear increasingly for Token Ring.

The TCP/IP software market for PCs has seen a similar transition from Ethernet to Token Ring. Older packages were developed just for Ethernet, but software is now available for Token Ring and Arcnet. The TCP/IP software also has to interoperate with the network operating system, preferably the one with which PC users are accustomed.

Available products most often support one or more of the major network operating systems, including Novell's Netware, Microsoft's LAN Manager and Banyan Systems, Inc.'s Vines.

As for server software, you're pretty much bound by the PC network operating system, says Daniel Graifer, senior vice president of financial systems at Franklin Mortgage Capital Corp. in McLean, Va. Organizations need to look for TCP/IP software for the Unix workstation, minicomputer or mainframe that is compatible with that network operating system.

The hunt won't take long if your network operating system supports TCP/IP, as Netware 3.11 and LAN Manager do. "If you're on LAN Manager, the obvious solution is to get LAN Manager [LM/X] for the Unix machine. If Netware, the obvious solution is to get Portable Netware," Graifer says.

If the network operating system doesn't support a TCP/IP protocol stack, users may have to run two user interfaces or "shells" — one for communicating with other PCs and one for communicating with other systems on the TCP/IP network.

This gives an organization more programs to choose from and is simpler than trying to support TCP/IP and PC networking in one product. However, it casts a burden on users, who need to reboot to switch shells, and it requires extra memory.

Depending on the organization's policies, linking to the enterprise network may also require some form of network management. If the network is primarily made up of Ethernet and Unix workstations or minicomputers, this will most likely take the form of the Simple Network Management Protocol, an industry standard for network management over TCP/IP networks.

If the network is primarily IBM mainframe-based, support for IBM's Netview network management protocols may be required.

SHARON FISHER

Making the transition from TCP/IP to OSI

BY MARSHALL ROSE

Ever since Open Systems Interconnect (OSI) was introduced in 1979, people have discussed how to move to that set of protocols or coexist with it. This is true even for companies running TCP/IP, the de facto solution for open systems networking.

It's questionable when — and if — OSI will achieve dominance over TCP/IP, but it's still a good idea to plan for coexistence or an eventual transition.

Not surprisingly, several different approaches have been developed to aid either a full transition or a move to coexistence (see chart) with OSI. Although there is no commonly agreed-on set of metrics to compare these strategies, here are four fairly intuitive ones:

- **Performance.** Once the strategy is implemented, how well does the system perform in terms of both throughput and latency? How are other applications on the network affected?
- **Flexibility.** Is a special-purpose solution (for instance, a dedicated gateway) required for each application, or can one general solution serve the needs of a wide range of applications?
- **Transparency.** Is it possible for end users to be unaware that the coexistence/transition strategy is "in the loop?"
- **Amenability.** How manageable is the strategy? Does it impose extra administrative burdens on the network operators?

Transparency and amenability, as defined above, often come into conflict. Some user communities may choose a less transparent strategy so that network administrators are less involved.

On the other hand, a strategy that offers seamless integration for users might pose significant problems for administrators.

Although you can compare these characteristics objectively — given a sufficiently rigorous set of benchmarking definitions — choosing among the alternatives is really a subjective process. Technical solutions to the transition and coexistence problem do not exist in a vacuum; they make sense only in the context of a particular set of requirements that may not be entirely technical in nature.

The difference between a transition strategy and a coexistence strategy is that transition occurs when a community consists of networks that contain only one protocol suite (e.g., TCP/IP) but wishes to run only another protocol suite (e.g., OSI).

Coexistence is potentially much harder: Two communities, each running one protocol suite, wish to interoperate. •

Rose is president of Mountain View, Calif.-based Dover Beach Consulting, which specializes in TCP/IP interconnectivity.

OSI transition strategies

Dual-stack approach

Put elements from both protocol suites in newer hosts, and run both protocols in all routers. The effect is to create two logical networks over a single physical one (i.e., packets from both protocol suites can be switched over the same media). When a dual-stack host wants to talk to a single-stack host, it has to decide which suite to use. This requires either a hint from the user or some kind of directory service. This is a good approach when you have control over all the routers and the router vendor supports both protocols.

Evaluation

Performance: No degradation
Flexibility: Good
Transparency: Potentially high
Amenability: All routers must run both protocols to avoid connectivity problems. Management is twice as hard as managing a network with one protocol suite.

Applications gateway approach

Deploy special servers that translate between similar services in the two suites (e.g., a converter between E-mail protocols X.400 and SMTP). Depending on the similarity of service, the quality of information may be reduced (e.g., images cannot be transmitted over text-only networks). This is a good approach when you want to minimize changes to the installed base of hosts and routers.

Evaluation

Performance: Usually poor but OK for mail and perhaps file transfer
Flexibility: None (each gateway is a special-purpose software box)
Transparency: Variable
Amenability: Requires changes to a very small subset of the installed base

Transport bridge approach

Deploy special routers that convert between the transport services in each suite. You then run applications from one suite in both protocol environments (i.e., run OSI applications over TCP/IP networks). When a pure OSI system wants to talk to an OSI-TCP/IP system, it goes through the transport bridge. This is a good approach when you want everyone to start using OSI applications. The downside: When two hosts have to use a transport bridge (because they don't speak the same lower-layer protocols), the bridge can be a single point of failure.

Evaluation

Performance: Fair
Flexibility: High (application-independent)
Transparency: Total
Amenability: TCP/IP-based hosts must run new applications protocols

Network tunnel approach

Encapsulate network protocol from one suite in the other suite (e.g., carry CLNP packets as IP traffic). A good approach when you want to deploy OSI-only hosts at multiple sites and you can't get all the routers to speak OSI.

Evaluation

Performance: No degradation
Flexibility: High (application-independent)
Transparency: Total
Amenability: TCP-based hosts must run OSI stack

Source: *The Open Book*, Marshall T. Rose, Prentice-Hall, 1989 CW Chart: Janell Genovese

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Costs are declining for TCP/IP on PC LANs

BY ERIC SMALLEY

Changes in the last few years have made it more affordable to bring TCP/IP to the personal computer local-area network environment.

TCP/IP software for PCs has dropped dramatically in price. There has been little change in single-node license prices, which go for about $400; however, for a 20-node license, prices have dropped from $350 per node to $175 today.

TCP/IP software vendors have reduced the amount of memory consumed by the software, so DOS machines do not require a memory boost. In some cases, a TCP/IP protocol stack, Network File System software and a network driver can occupy as little as 50K bytes of memory.

With the advent of the Network Device Interface Specification (NDIS), even more money is saved. Vendors have been selling network adapter cards that support multiple network drivers for years, allowing multiple network protocols to run on a PC with a single card. But the advent of standards for network adapter cards made multiple protocol support cost-effective because most networking vendors now support the standards.

End-user training and support for TCP/IP has also loomed as a significant cost issue. The surging popularity of Microsoft Corp.'s Windows 3.0 has started to change all that, as many TCP/IP vendors have begun supporting the graphical user interface. Instead of learning TCP/IP commands, users can click on icons or buttons and scroll through menus to use TCP/IP.

This new interface may improve the ease-of-use factor, but it still requires end users to be versed in two distinct networking schemes: the PC network operating system and TCP/IP. There's really no way to get around the increased need for training and support, even to the point of allocating additional support staff to the job.

One way to incur only a negligible expense is to install a TCP/IP gateway on the server for access to the host computer rather than putting software on each PC. Not only do you save on the number of sofware licenses, but you bring TCP/IP to PC LANs with the least disruption. The PC LAN is connected with the corporate network, but individual users don't have to operate in that new environment.

On the downside, gateways have some limitations. For one thing, the gateway translation process can slow the system. Gateways also limit the reach of TCP/IP network management systems, which are based on the Simple Network Management Protocol (SNMP). The SNMP management system cannot pick up information from individual machines beyond the gateway. •

Smalley is a Boston-based free-lance writer specializing in network technology.

Price tags

The following scenarios outline the estimated costs of putting TCP/IP on a LAN:

1) **Adding TCP/IP to a 100-node LAN with no network operating system:** A TCP/IP license costs $12,500, and an NFS license costs $3,500 for 100 PCs. The support staff needs to add personnel, but this can be a $30,000 entry-level position, since there is no network operating system to support.
TOTAL COST: **$46,000**

2) **Combining TCP/IP and a network operating system on a 100-node LAN:** An investment of $12,500 is again required for the TCP/IP license, but NFS is not. The support staff will need to hire someone versed in both the network operating system and TCP/IP, requiring a compensation package of about $50,000.
TOTAL COST: **$62,500**

3) **Using a gateway to link the LAN into the TCP/IP network:** If end users only need terminal access to TCP/IP hosts, a TCP/IP gateway can be installed either on the network server or on a dedicated server. Dedicated server gateways are priced from $4,500 to $6,000. Novell's gateway, the $4,995 NFS Netware Loadable Module, requires an upgrade to Netware Version 3.11, which costs $3,535. Network and Communications Management, Inc. in McLean, Va., offers TCP Server for Netware, formerly sold by Racal Interlan. This gateway costs $5,995 for 60 nodes. Banyan Systems, Inc. offers a nondedicated server TCP/IP gateway for its networks. It costs $1,995 for any number of users.
TOTAL COST: **$1,995 to $13,785.**

ERIC SMALLEY

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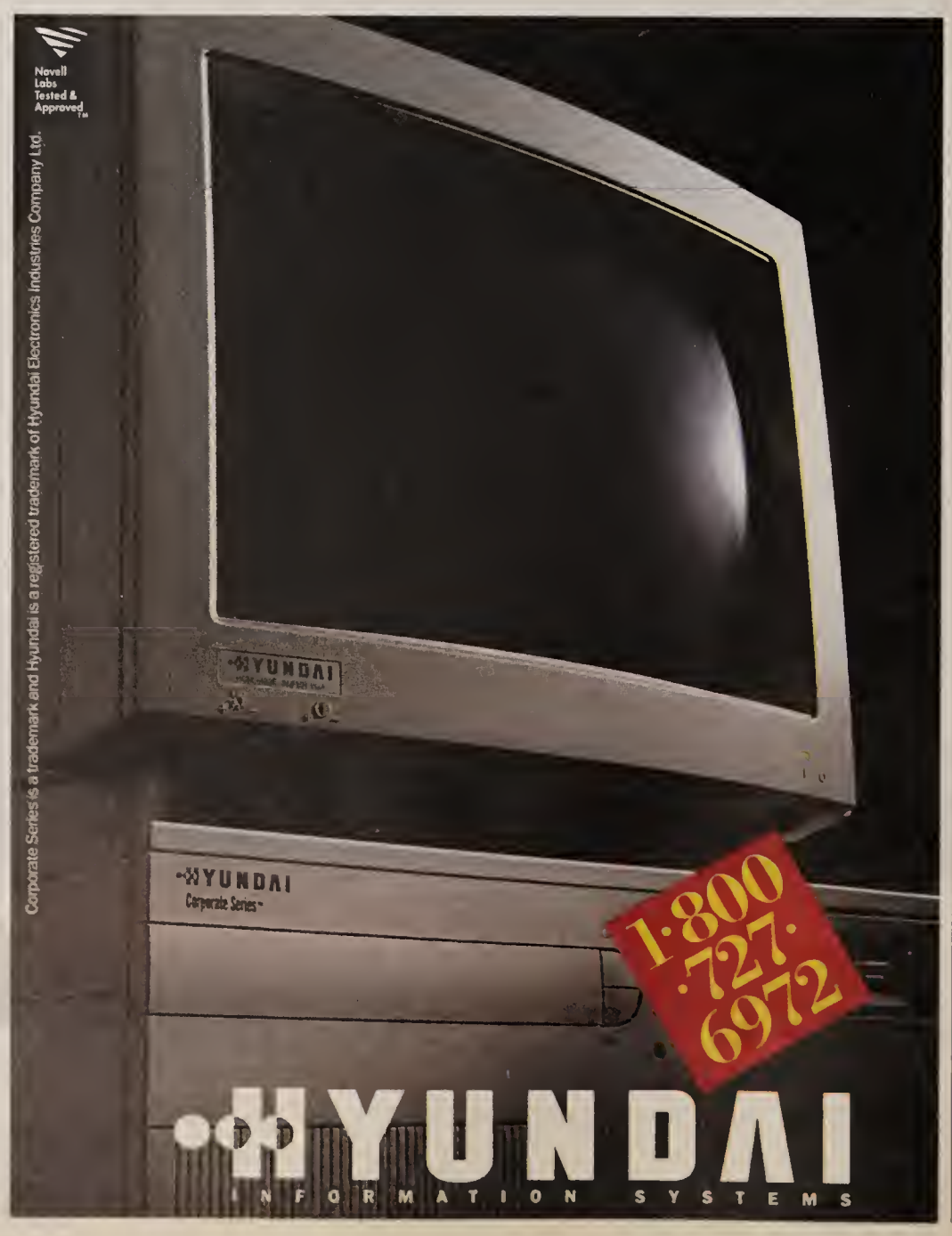

The trials, tribulations and triumphs of TCP/IP

Despite compatibility snags and implementation glitches, users say TCP/IP is worth it

School overcomes implementation bugs, secures robust network

Lower costs and easier management are the reasons the University of Washington in Seattle chose TCP/IP as its backbone network three years ago to connect a diverse array of hardware equipment.

"You name it, we've got it," says Terry Gray, director of networks and distributed computing. "We have about 5,000 PCs, 5,000 Macs, 500 X terminals, quite a few hundred Unix workstations and large IBM, Unisys and Digital machines."

Supporting Digital Equipment Corp.'s Decnet, Novell, Inc.'s IPX, Apple Computer, Inc.'s Appletalk and TCP/IP was getting to be both a budget and a management burden.

"Heterogeneity always costs more than you think it will," Gray says. Multiple protocol networks result in high support costs, and each protocol has its own quirks and bugs.

Not that the TCP/IP implementation was a run through the grass, but Gray's staff was willing to learn the ins and outs of TCP/IP and deal with occasional incompatibilities in order to eliminate multiple protocol headaches.

"We figured we would rather do one thing well than try to support many protocols poorly," Gray says. The reward was a single-protocol backbone that is more reliable and robust than the university's old multiprotocol network.

Most of the compatibility issues during the installation of TCP/IP revolved around the university's DEC machines.

"If the vendor supports TCP/IP as part of the protocol stack, there are no operating problems," Gray says. Unix machines are among those providing direct support in this way. Machines that support a proprietary protocol can link to TCP/IP if the vendor or a third-party vendor encapsulates the protocol into IP.

For example, to use the DEC VMS machines, which run on Decnet, the university had to install TGV, Inc.'s Multinet software, which encapsulates the Decnet packet within IP.

Earlier this year, DEC introduced a TCP/IP version of its Pathworks connectivity package, providing its own solution for connecting Decnet machines over TCP/IP.

The only remaining drawback to running DEC machines on TCP/IP is that DEC's LAT protocol for terminal emulation isn't fully implemented. LAT is designed for bridge-based networks but not router-based ones.

The upshot is that users running on VMS hosts cannot connect directly to other VMS hosts across campus. "Now I have to log into my machine [using LAT] and use another protocol, TCP/IP, to connect up to theirs," says Derek Haining, a systems programmer at the university.

"There are still issues to solve with respect to proprietary systems," Gray says. "But some of the more enlightened manufacturers understand how important it is to be interoperable with the rest of the world and are improving support for TCP/IP."

As for his future plans, Gray says, "Our grandchildren will still be using TCP/IP. I don't see a migration to OSI [happening] in my lifetime."

■ ■ ■

Support team's discovery: Beware of varying vendor versions

The course of interoperability never runs smoothly. That's what Tom Moore learned when he tried to link several Appletalk local-area networks at the Redstone Arsenal in Huntsville, Ala., to the site's extensive TCP/IP network.

"Macs are beautiful machines, and we love them here, but we encountered incompatibilities between [Apple Computer, Inc.'s] implementation of TCP/IP and others we've been running for several years," says Moore, director of installation support for information systems command. Because of the incompatibilities, it took several months to bring Redstone's Appletalk networks into the TCP/IP fold.

The problem was evident as soon as Macintosh users tried and failed to communicate through the backbone's routers with machines on other LANs.

After consulting with Apple and router manufacturer Proteon Corp., Moore discovered that the version of TCP/IP in Appletalk 3.0 was different from that supported in Appletalk 2.0, which Proteon supported.

"Apple didn't choose to abide by the rules," Moore says. "All our other hardware was compatible with the Proteon routers." To resolve the issue, Proteon updated its routers to support Appletalk 3.0.

Bringing the Appletalk LANs on board was the last step in the TCP/IP implementation at Redstone. During the course of

Continued on page 105

The stories on these two pages were written by Lucie Juneau, a free-lance writer and editor based in Salem, Mass.

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Trials

CONTINUED FROM PAGE 103

several years, Redstone's three-tiered computer architecture has been integrated into a fully interoperable TCP/IP backbone network, Moore says.

"Initially," he says, "we had the departmental-level minicomputers linked," including Unisys Corp. 5000s, IBM RISC System/6000s and minicomputers from Digital Equipment Corp., Hewlett-Packard Co. and others. Linking the minicomputers to Ethernet was relatively easy, Moore says, because most of them ran Unix.

Next, Moore linked the Arsenal's mainframes to the minicomputers via TCP/IP. This included machines from Amdahl Corp., IBM and National Advanced Systems running IBM's MVS, as well as one Amdahl machine running UTS, a Unix operating system.

The mainframes were linked to the TCP/IP Ethernet backbone using Fibronics Corp.'s K-Net 2000 boxes and Intel-based Unipath 9700 front-end processors, Moore says.

Personal computers, Macintoshes and workstations were the last to interface with TCP/IP. Most of the PCs were linked to the TCP/IP backbone via 3Com Corp. or Novell, Inc. LANs, whose servers connect directly to TCP/IP. The Appletalk networks were linked using Gatorboxes from Cayman Systems, Inc.

Since the Macintosh problem was resolved, the TCP/IP network has been working fine, Moore says.

■ ■ ■

Sometimes, the secret to success is two protocols: TCP/IP and NFS

When Yankee Atomic Electric Co. in Bolton, Mass., set out to link its multiple-platform computers three years ago, it had two choices: TCP/IP or DEC's Personal Computer Systems Architecture (PCSA).

The winner? TCP/IP.

"We wanted to use something that would move us into a Unix environment," says Lew Townson, Yankee's programmer and network administrator.

The equipment that needed to be linked included four DEC machines, a Cyber 960 from Control Data Corp., 100 PCs and an Apple Computer, Inc. Appletalk network.

To determine specific interoperability needs, Yankee set up a task force, identifying such requirements as virtual disk capabilities, high-speed file transfer and virtual printing.

The task force considered PCSA — DEC's strategy to tie VMS and Ultrix machines to DOS, OS/2 and Apple Macintosh equipment. While the architecture could provide connectivity via Decnet, Yankee rejected it for two reasons.

For one, it would work only with DEC's proprietary Ethernet board, which cost about $500 — three times more than the $150 Western Digital, Inc. boards that Yankee was using. Purchasing DEC's board for each of Yankee's 100 PCs would have been expensive. (Note: Today's implementaton of PCSA DOS client software — Pathworks for DOS — is compatible with industry-standard boards.)

More significantly, PCSA was unable to interoperate with the Cyber machine, which Yankee used for number crunching. It was also incompatible with Yankee's Intergraph Corp. computer-aided design server. The current version of Pathworks still does not link easily with either of those machines.

When task force members considered TCP/IP, they realized it could not handle virtual disk and printing, so they settled on a dual-protocol solution: TCP/IP and Network File System (NFS).

"We knew TCP/IP would do file transfers for us and provide connectivity," says Barry White, senior systems analyst at Yankee. Sun Microsystems, Inc.'s NFS could support virtual disk and printing capabilities.

There were some hurdles to jump along the way, however. Yankee had a hard time finding server software for the VAX/VMS system that could handle the heavy volume of traffic between the VAX server and the many PCs around the building. After trying many different products, Yankee chose TGV, Inc.'s Multinet NFS server software to run on the VAX 4200.

The PCs are tied into the Vaxcluster via Sun Microsystems, Inc.'s PC NFS client software. Townson says Multinet NFS does an excellent job of serving the PCs. To link in the Cyber machine and Appletalk network, Yankee had to purchase some interface products. For the Cyber, it chose CDC's own TCP/IP interface and a separate product for NFS.

To tie the Appletalk network into the backbone, it purchased Cayman Systems' Gatorbox, which encapsulates Macintosh protocols in TCP/IP.

"Once you install the software products and get a connection, TCP/IP works fairly well," Townson says. About 50 printers on the VAX system are available to PC users. Using the client/server software, "anyone with a PC can do high-speed file transfers, virtual printing and virtual disk for storing files."

Since its NFS and TCP/IP network was installed, Yankee's operations have grown. But this hasn't caused problems on the network. When machines have become outdated, Yankee has incorporated new ones.

Today, aside from one small PC local-area network, all of Yankee's computers are part of the TCP/IP and NFS backbone, including 350 PCs. •

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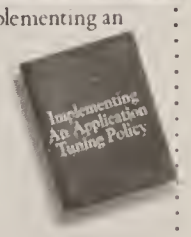

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PRODUCT SPOTLIGHT

TCP/IP application suites for PCs

VENDOR	PRODUCT	HARDWARE	OPERATING SYSTEM	MINIMUM RAM (BYTES)	HARD DISK SIZE (BYTES)	READY-TO-USE APPLICATIONS[1]	TERMINAL EMULATION	E-MAIL STANDARDS SUPPORTED	COMPATIBLE NETWORK OPERATING SYSTEMS	COMPATIBLE WIDE-AREA NETWORKS	NUMBER OF CONCURRENT TCP/IP SESSIONS SUPPORTED	SUPPORTS NETBIOS	TCP/IP STACK IMPLEMENTATION	USER INTERFACE	SECURITY FEATURES	PRICE
Banyan Systems, Inc. (508) 898-1000	TCP/IP routing for servers, TCP/IP for client workstations	PCs, 80386, I486, SMP	DOS 5.0 server, Unix	60K server, 50K client	40M server	Telnet, FTP, E-mail	VT 52, VT 100, VT 220, TN3270	SMTP, PC Mail, Vmail	Vines	SNA, Decnet	NP	Yes	DLL	Command-driven	Single-user password	$1,995 - $3,995 server, $2 995 - $3,995 client
Beame and Whiteside Software Ltd. (416) 648-6556	BW-NFS for DOS	IBM PCs with 256K RAM	DOS 3.1	56K, 256K recommended	10K	Telnet, FTP, terminal emulation	VT 52, VT 100, VT 220, TN3270	None	Netware, 3+Share, LAN Manager, 3+Open, Vines	IP	20	No	Device driver	Command-driven, GUI	Single/multiuser passwords, internal data encryption	$349
	BW-TCP for DOS	IBM PCs and compatibles	DOS 3.1	30K, 256K recommended	10K or greater	Telnet, FTP, terminal emulation	VT 52, VT 100, VT 220, TN3270	None	Netware, 3+Share, LAN Manager, 3+Open, Vines	IP	20	No	Device driver	Command-driven, GUI	Single/multiuser passwords, internal data encryption	$245
Digital Equipment Corp. (508) 493-7161	Pathworks for DOS TCP/IP Version 1.1, Pathworks for OS/2 Version 1.0	Selected Intel 80286, 80386, I486-based systems with one disk drive, one network connection	OS/2 Version 1.1 or later	640K/DOS, 4M/OS/2	8M	Telnet, FTP, E-mail, Ping, ARP, Netstat	VT 100, VT 220, VT 320	Mail-II, SMPT	LAN Manager, Pathworks	Decnet	8 for DOS, 32 for OS/2	Yes	DLL, device drivers	Command-driven	Single/multiuser passwords	$100
Distinct Corporation (408) 741-0781	Distinct TCP/IP for Windows	IBM AT, PS/2 or compatible	DOS 3.3 or later, Windows 3.0	640K, 4M recommended	Less than 1M	Telnet, FTP, Backup, Ping	VT 52, VT 100	Unix mail	Netware, LAN Manager, 3+Open, Vines	SNA, Decnet	64	No	DLL	GUI	Single/multiuser passwords, file encryption	$395
Dowty Network Systems, Inc. (415) 508-2500	Scanet	IBM PC, PS/2, Macintosh	OS/2, DOS 3.0	256K	3M	Telnet, FTP, E-mail (optional)	VT 100, VT 220, TN3270, 5250	X.400	Netware, LAN Manager, 3+Open, Vines, PC-NFS, LMX	SNA, Decnet, TCP/IP, OSI	10	Yes	DLL, TSR	Command-driven, GUI	Single-user password, transmission encryption	$1,200 - $30,000 (up to 250 users)
Essex Systems, Inc. (508) 532-5511	TCP/2	PC AT, PS/2, EISA	OS/2 1.0	2M, 5M recommended	6M	Telnet, FTP, E-mail, remote log-in, printer access, command execution, file transfer, tape access, network information services, news reader, mail/message, servers, configuration management, diagnostic	VT 100, TN3270	SMTP, POP, PC Mail	Netware, 3+Share, LAN Manager, 3+Open, Vines, Lantastic	NA	Approximately 60	Yes	Device driver	Command-driven	Single/multiuser passwords, transmission encryption, Kerberos security	$475
	TCP/2-DOS	PC XT, AT, PS/2, EISA, Z100	DOS 3.1	512K, 2M recommended	3M	Same as above	VT 100, TN3270	POP, PC Mail	Netware, 3+Share, LAN Manager, 3+Open, Vines, Lantastic	NA	4	Yes	TSR, protected mode, extended memory version	Command-driven	Single/multiuser passwords, transmission encryption, Kerberos security	$375
Frontier Technologies Corp. (414) 241-4555	SuperTCP for Windows	Ethernet adapter, Token Ring, IBM PCs and compatibles	DOS 3.3	1M, 2M - 4M recommended	2M	Telnet, FTP, E-mail, Ping	VT 100, VT 220, TN3270	SMTP, POP 2, 3	Netware, LAN Manager, Vines	X.25	64	No	DLL	GUI	Single/multiuser passwords	$495
	SuperTCP for DOS	Ethernet adapter, Token Ring, IBM PCs and compatibles	DOS 2.1	512K, 640K recommended	1.5M	Telnet, FTP, E-mail, Ping, Chat	VT 52, VT 100, TN3270	SMTP, POP 2, 3	Netware, LAN Manager, Vines	X.25	64	No	DLL	Command-driven, GUI	Single/multiuser passwords	$395
FTP Software, Inc. (617) 246-0900	PC/TCP for DOS version 2.05	IBM PCs and compatibles	DOS 3.0 or later	256K	2M or greater	Telnet, FTP, E-mail, TAR, Ping, host, Inet, finger, print redirection, Berkeley "R" utilities	VT 52, VT 100, VT 220, TN3270	SMTP, POP 2, 3 PC Mail	Netware, 3+Open, 3+Share, Vines, LAN Manager, Lantastic, DEC, PCSA	Any using TCP/IP	32	Yes	TSR	Command-driven	FTP server can check for user password combination	$400
Grafpoint, Inc. (408) 446-1919 (800) 426-2230	X-One 386	Intel 80386 or I486-based PCs	DOS 3.1	4M	20M or greater	Telnet (optional)	Alphanumerical terminal	None	Netware, 3+Share, LAN Manager, 3+Open, Vines, Lantastic	Decnet	1	No	DLL	GUI	None	$495
	TNET 4200	IBM PCs and compatibles	DOS 3.0	512K, 640K recommended	Greater than 1M	FTP (optional)	VT 52, VT 100, VT 220, TEK 4200	None	Netware, 3+Share, LAN Manager, 3+Open, Vines, Lantastic	Decnet, TCP/IP, Token Ring, NFS	1	Yes	DLL	Command-driven	None	$995
Hughes LAN Systems, Inc. (415) 966-7300	Prolinc Connectivity Software	IBM XT, AT, Intel 80386, I486	DOS 3.3 or 5.0	512K, 640K recommended	10M	Telnet, FTP, E-mail, Ping 1	VT 52, VT 100, VT 220, TN3270	SMTP, POP1, 2	3+Open, 3+Share, Vines, LAN Manager, Netware	SNA, Decnet LAT	8	Yes	TSR	Command-driven	Within user interface	$450 (single user), $350 per user for 25-user package
IBM (800) 426-2255	IBM TCP/IP Version 2.0 for DOS	IBM PCs and compatibles	IBM or MS-DOS 3.3 or later	320K, 640K recommended	5M	Telnet, FTP, E-mail, LPR, NFS (optional)	VT 100, VT 220, TN3270, third-party emulators	SMTP client, POP 2	Netware, LAN Manager, NDIS, Packet drivers, LAN support	ASYNC-SLIP	10 sockets, 8 Telnet	No	TSR	Command-driven, GUI	Single/multiuser passwords	$200 base, $125 NFS, $500 tool kit
	IBM TCP/IP Version 1.2 for OS/2	IBM PS/2, PC AT, industrial computer	OS/2 1.3 SE, OS/2 1.3 Extended, OS/2 2.0	2M	14M	Telnet, FTP, E-mail, SNMP, LPD/LPR, Rexec/D, X Window System (optional), NFS (optional)	VT 100, VT 220, TN3270	La Mail	NDIS	X.25	Multiple client and server	Yes	TSR	Command-driven, GUI	Single/multiuser passwords, Kerberos	$200 (base), $150 (X), $150 (NFS), $150 (X.25), $500 (tool kit)
Intercon Systems Corp. (703) 709-9890	TCP/Connect II	Macintosh Plus	Macintosh System 6.05	2M	NA	Telnet, FTP, E-mail, Net news reader, SMP agent, finger client/server	VT 52, VT100, VT 220, TN3270, Tektronix 4014	SMTP	TCP/IP	TCP/IP	Limited only by RAM	No	Init	GUI	Single/multiuser passwords, file encryption	$195 for basic, $495 for extended versions
Kea Systems Ltd. (604) 431-0727	Kealink TCP	3Com, Western Digital or other Ethernet card with NDIS	DOS 2.0	70K, 100K recommended	150K	Telnet (optional), FTP	Keaterm, Zstem	None	LAN Manager	None	10	Yes	Device driver	Command-driven	None	$150
Locus Computing Corp. (213) 670-6500	Locus TCP/IP for DOS	IBM PCs and compatibles	PC-DOS or MS-DOS 3.1 or later	256K	200K	Telnet, FTP, RSH, Rexec	VT 52, Heath-19	None	None	None	32	No	TSR	Command-driven	None	$195

[1]Bundled unless otherwise specified.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

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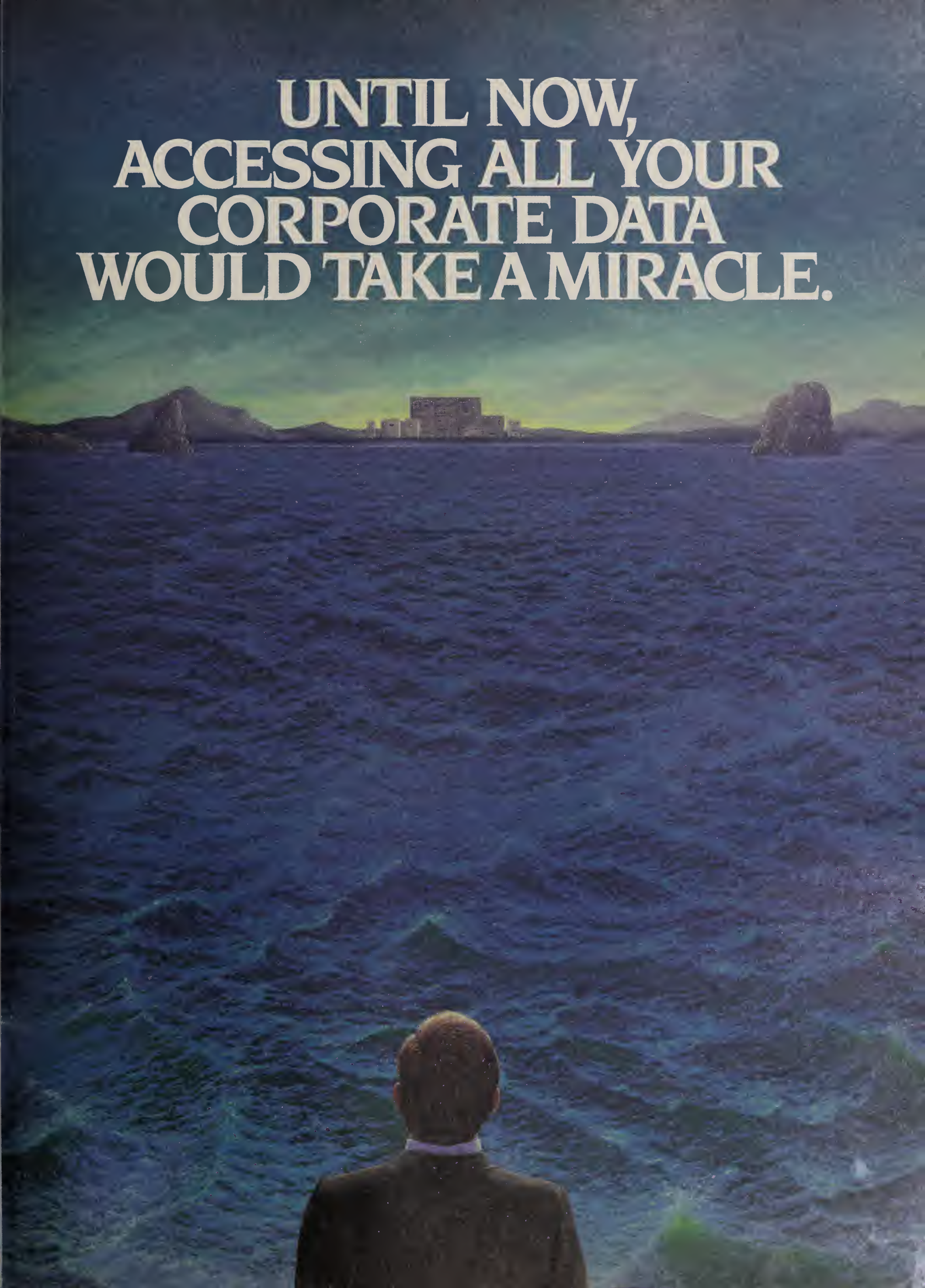

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	HARDWARE	OPERATING SYSTEM	MINIMUM RAM (BYTES)	HARD DISK SIZE (BYTES)	READY-TO-USE APPLICATIONS[1]	TERMINAL EMULATION	E-MAIL STANDARDS SUPPORTED	COMPATIBLE NETWORK OPERATING SYSTEMS	COMPATIBLE WIDE-AREA NETWORKS	NUMBER OF CONCURRENT TCP/IP SESSIONS SUPPORTED	SUPPORTS NETBIOS	TCP/IP STACK IMPLEMENTATION	USER INTERFACE	SECURITY FEATURES	PRICE
Netmanage, Inc. (408) 257-6404	Chameleon	Any configuration that runs Windows 3.0 and NDIS-compliant network card	Windows 3.0, DOS 3.3 or later	10K DOS	Less than 500K	Telnet, FTP, E-mail, TFTP, Ping, custom, Bind, statistics	VT 52, VT 100, VT 220, TN3270, X server (all optional)	SMTP	Netware, 3+Share, LAN Manager, 3+Open, Vines	TCP/IP	16	No	DLL	GUI	Single/multiuser passwords	$400 single unit; $170 per copy at quantity of 100
	Newt-SDK	Any configuration that runs Windows 3.0 and NDIS-compliant network card	Windows 3.0, DOS 3.3 or later	10K DOS	Less than 500K	Telnet (optional), FTP (optional), E-mail (optional), Berkeley 4.3 BSD socket, FTP-DLL, SMTP-DLL, custom, statistics	VT 52, VT 100, VT 220 (all optional)	SMTP	Netware, LAN Manager, 3+Open, Vines, Lantastic	TCP/IP	16	No	DLL	GUI	Single/multiuser passwords	$500; requires Chameleon
	RPC-SDK	Any configuration that runs Windows 3.0 and NDIS-compliant network card	Windows 3.0, DOS 3.3 or later	10K DOS	Less than 500K	Telnet, FTP, E-mail, Ping, Bind, Portmapper, RPC DLL, RPCGEN (all optional)	VT 52, VT 100, VT 220 (all optional)	SMTP	Netware, LAN Manager, 3+Open, Vines	TCP/IP	16	No	DLL	GUI	Single/multiuser passwords	$500; requires Newt-SDK
Network Research Corp. (805) 485-2700	Fusion for DOS	IBM PCs and compatibles	DOS 3.0 or later	640K, 640K - 2M recommended	Any	Telnet, FTP, NFS client, R-commands	Optional VT 100, VT 220, TN3270, X Window System	NA	NDIS-compatible	NP	32	No	TSR	Command-driven, GUI	NP	$295
Novell, Inc. (801) 429-7000 (800) 638-9273	LAN Workplace for DOS 4.0	IBM PCs and compatibles with Intel 80386	DOS 3.1 or later, Windows 3.0 or later	512K, 640K recommended	1.5M	Telnet, FTP, remote utilities	VT 52, VT 100, VT 220, TN3270, ANSI	NA	Netware, IBM LAN support, any ODI-based protocol	NA	64	Yes	TSR with companion DLL	Command-driven, GUI	Single/multiuser passwords	$450 (single user), $1,995 (10 users)
	LAN Workplace for Macintosh Version 1.1	Macintosh SE, SE/30, Plus, any Macintosh II with 1M minimum RAM and one 800K floppy must connect to Ethernet network via Localtalk gateway or Ethernet adapter interface	Macintosh System 6.02 or later, Appleshare, Netware Version 2.15 or later	1M	NA	Telnet, FTP	VT 52, VT 100	None	Netware	NA	7	No	Macintosh device driver	GUI	NA	$250
	LAN Workplace for OS/2 Version 2.0	Intel 80286-, 80386-based PC/Ethernet or Token Ring network adapter with one corresponding NDIS driver	OS/2 1.1 or later	1M	1M	Telnet, FTP	VT 52, VT 100, VT220	NA	Netware	NA	256	Yes	OS/2 device driver	Command-driven	Single/multiuser passwords	$495
Persoft, Inc. (608) 273-6000	Smarterm 340	IBM PCs and compatibles, Intel 80386	DOS 2.1	300K, 640K recommended	Greater than 2M	Telnet, FTP, LAT	VT 52, VT 100, VT 220, VT 340, VT 320, DG 470	NA	Netware, 3+Share, LAN Manager, 3+Open, Vines, Lantastic, NDIS, Ungermann-Bass, Pathworks	Decnet	5	Yes	TSR	Command-driven	None	$375 (single user), $1,495 (five users), lower price for text-only available
Simware, Inc. (613) 727-1779	SimPC 6.0	IBM PC XT compatibles and later	DOS 2.1, FTP TCP/IP stack	512K, 640K recommended	1.5M	Telnet, Simxfer (optional)	VT 100, TN3270, TTY	NA	Netware, Vines	SNA, Decnet	1	Yes	TSR	Command-driven, GUI	Single-user passwords, transmission encryption	$395
Sunconnect, a Sun Microsystems, Inc. business (800) 872-4786	PC-NFS Version 3.5	IBM PCs and compatibles	MS-DOS 3.1 or later	512K, 640 recommended	20M	Telnet, FTP, E-mail (optional), Ping, Rshell, Netstat	VT 52, VT 100, VT 220, TN3270, Tek 4014, VT 320	POP, SMTP	Netware, 3+Share, LAN Manager, 3+Open, Vines	SNA, Decnet	16	No	DLL, TSR	Command-driven, GUI	Single/multiuser passwords	$325
3Com Corp. (408) 764-5000	3Com TCP with DPA	3Com Ethernet Token Ring adapter, IBM PCs and compatibles	DOS 3.1 or later, OS/2 1.2 or later	640K, 640K+ recommended	1 - 2M	Telnet, FTP, NFS client (optional)	VT 52, VT 100, TN3270	NA	Netware, 3+Share, LAN Manager, 3+Open	TCP/IP	1 - 8	Yes	TSR	Command-driven, GUI	Single/multiuser passwords	$350 (single user), $1,495 (10 users), $2,995 (30 users), $30,000 (500 users)
Ungermann-Bass, Inc. (408) 496-0111 (800) 873-6381	Net/One TCP	IBM PCs and compatibles	DOS 3.1, OS/2 1.1	512K, 1M recommended	10M	Telnet, FTP, E-mail (third party)	VT 100	SMTP, X.400	Netware, LAN Manager, 3+Open	SNA, Decnet	Unlimited	Yes	Driver	Command-driven, GUI	None	$110 (single user), $550 for server license
Venturcom, Inc. (617) 661-1230	Embedded TCP/IP	Intel-based 80386, I486 PCs	E-Venix	250K	NA	Telnet (optional), FTP, E-mail	VT 52, VT 100, VT 220, TN3270	Send mail	All TCP/IP-compatible	SNA, Decnet	Limited by system memory only	Yes	Unix streams module	Command-driven	Standard Unix security	$100
	TCP/IP	Intel-based 80386, I486 PCs	Venix or other real Unix	250K	60M	Telnet (optional), FTP, E-mail	VT 52, VT 100, VT 220, TN3270	Send mail	All TCP/IP-compatible	SNA, Decnet	Limited by system memory only	Yes	Unix streams module	Command-driven	Standard Unix security	$495
Walker Richer & Quinn, Inc. (206) 324-0407	TCP connection, 3000 connection	IBM PCs and compatibles, any network card supported by NDIS-compliant driver	DOS 2.0	175K, 640K recommended	Not required	Telnet, FTP	VT 52, VT 220, TN3270, VT 320, VT 102, VT 340, VT 350, VT 241, VT 240, Tektronix 4014, HP 2300, HP 2600	None	Netware, LAN Manager, 3+Open, Vines, Lantastic	Decnet	16	No	TSR	Command-driven, GUI	Single/multiuser passwords, file encryption	$99 - $299
Wollongong Group, Inc. (415) 962-7100	Pathway Access for Macintosh	Macintosh Plus, SE, SE/30 or any Macintosh II	Macintosh System 6.05 or later	1M, 2M recommended	650K	Telnet, FTP, remote printing	VT 52, VT 100, VT 220, TN3270, VT 240, VT 320, VT 330, VT 340	None	Appleshare	TCP/IP	Limited by memory only	No	Macintosh OS driver, Apple's MacTCP	GUI	Single/multiuser passwords	$295 (single user); $1,195 (five users); $1,995 (10 users); $3,495 (20 users); $7,495 (50 users); $12,495 (100 users)
	Pathway Access for DOS	IBM PCs and compatibles	DOS 3.3 to 5.0	28K, 640K for DOS with 2M for Windows recommended	2.3M	Telnet, FTP, E-mail, R utilities, remote printing	VT 52, VT 100, VT 220, VT 240, VT 320, VT 330, VT 340, TN3270	SMTP	Netware, 3+Share, LAN Manager, 3+Open, Vines, Lantastic, DEC Pathworks	TCP/IP	32	Yes	TSR	Command-driven, GUI	Single/multiuser passwords	$395 (single user), $1,195 (five users), $1,995 (10 users), $3,495 (20 users), $7,495 (50 users)

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Banks assess IS' worth

Banks have rarely had to tie IS investment to business impact, but that may be changing as economic woes force them to spend smart

Second in a series on assessing the value of information technology in vertical industries.

BY ALAN J. RYAN

The banking industry may have a reputation for stodginess and conservatism, but it has spent, and spent heavily, on information systems — an estimated $12 billion this year alone — without requiring much documentation of bottom-line impact.

Not that making such a connection would be an easy task. After all, IS has become so thoroughly ingrained in banking that the industry would be at a virtual standstill without it. Trying to assess the value of IS on the bottom line in banking would be like trying to measure the value of an accounting department or a personnel department, bank IS executives say.

IS is simply "integrated into the business fabric. You don't measure too many business fabrics," says Fred L. Cisewski, senior vice president and director of MIS at Bank South NA in Atlanta, which has a 1991 IS budget of roughly $10 million. "IS is integrated into the overall business plan," Cisewski says, "so why would you want to differentiate it?"

David B. D'Braunstein, vice president of the Commercial Operations & Support Department at Security Pacific Automation Corp. in Glendora, Calif., concurs. D'Braunstein, who has worked in banking IS since the 1960s, says that when he started, "there was no business case needed for IS projects. Someone just said, 'Do it,' and you'd do it."

But while these executives haven't yet been mandated to provide a direct link between systems implementations and business profitability, they are being asked to think about IS economies. With banks facing a faltering economy and bad debt, IS is being asked to look at the areas in which it *can* make dollar measurements: applications development costs, departmental budgets, chargeback fees, outsourcing expenditures, data center costs, project payback periods and personnel.

To discuss how the banking industry goes about assessing IS' worth, *Computerworld* brought together Cisewski, D'Braunstein and two other IS executives — Peter D. Conley, IS manager at First Alabama Bank in Montgomery, Ala., and Richard A. Spradling, vice president of systems and technology at Farm Credit Bank of St. Louis in Missouri — at the American Bankers Association National Operations and Automation Conference in Orlando, Fla.

Focus on costs

With bank profits flat or declining in much of the industry, more attention is being paid to operating expenses. "The interest on profitability is going to have to be throughout the enterprise and not just at the very top," says Robert Moll, director of the Center for Financial Services Research at Arthur D. Little, Inc. in Cambridge, Mass.

D'Braunstein says his department is very business-case-motivated today. For IS projects, "there is much more of a focus on hard dollar justification than ever before. If you can't improve your revenue stream coming in or cut staff in a very short time going out, then your project will be automatically deferred," he explains.

For instance, applications development gets a hard look these days. "The idea that if we haven't built it ourselves it is no good is gone. That's history," D'Braunstein says.

To build a business case these days, IS needs to have its act together. "You have to have your project life cycle laid out, and you have to have your return on assets and equity and investments laid out in detail," D'Braunstein says. Doing your homework up front means fewer chances of having your proposals rejected, he adds.

Spradling says IS should "build its case for the project based upon capacity planning and the bank's vision of the future."

He adds that projects that are likely to impact external bank customers are more likely to receive funding than those designed to make life easier for internal customers. If finances get tight, projects for internal bank users can be deferred to help save money, while projects that impact the outside customers will continue to receive funding.

Photo: Jeff Blanton

(Left to right): *Cisewski, D'Braunstein, Spradling and Conley agree that part of the value of IS is in working smart*

Part of a team

These IS managers say there are some obvious ways to place a dollar figure on technology in a bank. The most common would be to take an inventory of hardware and software and to track the dollars brought in through chargeback fees they receive from other bank areas using their services.

However, the roundtable participants say that if they were asked to try to measure the intrinsic value IS brings to banking, they would look to their relationships with other bank departments rather than just looking at dollars. Put simply, they are working for the user departments and can measure the worth of their systems through their importance to those departments.

For instance, Conley at $6.3 billion First

Continued on page 116

Ryan is a *Computerworld* associate editor, features.

Credit where credit is due

How banks assess the business value of IS

- Determine impact of IS on other bank departments; this can range from a subjective evaluation to a chargeback review.
- Examine projected payback periods and gains of IS projects.
- Conduct postimplementation reviews to see whether promises of IS projects meet expectations.
- Analyze report cards from user departments.
- Examine IS costs, including evaluating outsourcing.

CW Chart: Marie Haines

Nightmare Scenario #1

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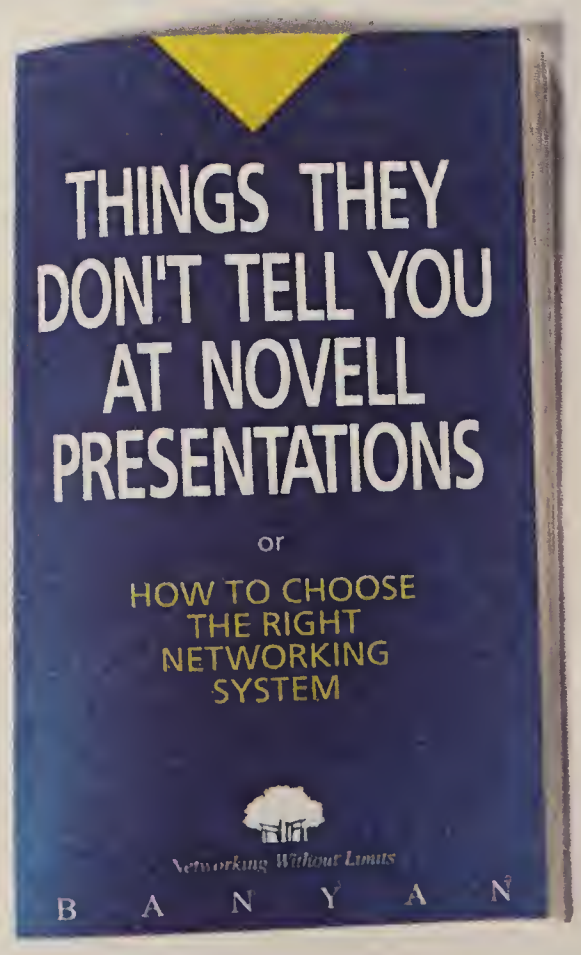

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Continued from page 113

Alabama says his department, which has a $10 million budget for 1991, is evaluated through a quarterly report card rating IS service levels to the bank's business areas. "IS performance is based on performance with the business areas," he says.

In fact, the bonds between business function and IS are often so strong that in many of the banks, IS projects are proposed to top management by the user departments themselves, either alone or in conjunction with IS.

At Farm Credit Bank, Spradling says, IS expenditures are considered to be one component of a project that might span two or more business units or the entire company. "Our business plan calls for increases in market share and increases in productivity," he explains.

Therefore, the IS technical-level plans must be tied in with the business strategies. Spradling says his bank is considering redesigning business processes to help bring about a doubling of productivity in its loan organization. He justified the project by estimating that it would increase productivity 100% without increasing head count. The package as a whole is justified — not just the IS portion.

In fact, Spradling says, IS has an increasingly difficult time putting forth projects on its own that will impact the business. "What is now required is a joint effort [by IS and business users] of reviewing the process, changing the way business is conducted and applying technology to make it more effective."

In-house vs. outsourcing

Another way IS economies can be studied, the roundtable participants say, is based on how the organization is run within the bank — such as whether the IS department is staffed with in-house employees or run by an outsourcer.

Allocating money to an outsourcer is nothing new to the banking industry, which frequently looks to outside parties to handle everything from mail-room operations to credit card systems to third-party check processing.

> "THE IDEA THAT if we haven't built [an application] ourselves it is no good is gone. That's history."
>
> DAVID B. D'BRAUNSTEIN
> SECURITY PACIFIC

In fact, in such a heavily government-regulated environment, it is easier to let someone else deal with the technology and the ever-changing regulations, those who outsource say. Through outsourcing, a bank can easily review its IS spending by comparing outsourcing costs with the cost of running the data center without outside help.

At the $5.4 billion (in assets) Bank South, Cisewski says, the entire IS operation has been outsourced, which has helped IS save money. It also means that Cisewski and his staff do not have to spend all kinds of time justifying individual IS expenditures. Instead, he says, "You can concentrate on the business issues." The outsourcing firm actually makes the pricing and tabulation of costs of new kinds of IS services easier, he adds.

The $4 billion (in assets) Farm Credit Bank, which has an annual IS budget of $5 million and 15 employees, has outsourced its applications development, telecommunications and data center operations, with Electronic Data Systems Corp. as the primary vendor. Because of that, Spradling explains, the traditional, semifixed costs associated with moving to different computing plateaus become variable and hence more easily curbed.

What about judging the value of basic expenses, such as maintenance of critical systems that require a certain number of bodies to keep them running smoothly? When it comes to maintenance-type items, Spradling says, the investment is directly determined by the user. "We allocate everything out, sit down with the user at the beginning of the year, talk through the maintenance-type initiatives on existing projects. We basically say, 'How much do you want to continue to invest in the applications that we've worked with you on in the past? Low investment is going to mean more errors, more quality problems, slower response.' We negotiate service standards with the customer up front."

Looking at results

Another way to measure the value of IS projects and spending is by comparing the actual results with project results and payback periods. D'Braunstein says that in an age of increasing bank competitiveness, payback horizons are shrinking. "If you can't get payback from a system in two years or less, then it is going to be deferred."

As long as the department can justify and make a valid case for the expenditures — and show that payback periods for the expenses are reasonable — it usually gets the funding it requires, D'Braunstein says.

Security Pacific Corp. has assets of $83 billion, and Security Pacific Automation, the bank's automation company, has a $438 million budget and an IS staff of 5,800. For Security Pacific Automation, the test of IS value and how it is measured is especially important because the bank is being acquired, subject to shareholder and regulatory approval, by Bankamerica Corp., which will merge the IS departments [CW, Aug. 19].

For now, D'Braunstein says, it's pretty much business as usual for his department.

No set ways

Even with all these ways to assess internal IS costs, the roundtable participants say, the fact remains that there are still no set ways to tie any of the IS value measurements they employ to the bank's overall bottom line.

However, Arthur D. Little's Moll says that while they remain in the minority, there are banks that are actively making the effort to link IS costs to their bottom-line impact.

One of the ways they do this is by using computer-simulated models to predict the behavior of the banking operation after a new system has been installed. The technique can help minimize the risk of IS expenditures while providing a handle on the ultimate investment and return for IS projects, he says.

But no matter what tools they elect to use, IS chiefs in the volatile banking industry need to remember that part of the value of IS is in working smart.

D'Braunstein relates a story of requesting funding for an IS project. His boss suggested he "go back and sharpen his pencils." But he didn't need to. He says that when you work in IS, your job could be on the line if you give unrealistic expenditure expectations. "It's far better to take that approach than to say, 'OK, chief, I think we can do it for 10% less or 20% less' and then come back after the fact to say it cannot be done." •

Go figure

IS value is hard to determine for banks because technology is such an integral part of what they do. But pressure is building for some kind of assessment.

"IS is integrated into the overall business plan, so why would you want to differentiate it?"

Fred L. Cisewski
Bank South NA

"If you can't get payback from a system in two years or less, then it is going to be deferred."

David B. D'Braunstein
Security Pacific Automation Corp.

"IS performance is based on performance with the business areas."

Peter D. Conley
First Alabama Bank

IS should "build its case for the project based upon capacity planning and the bank's vision of the future."

Richard A. Spradling
Farm Credit Bank of St. Louis

CW Chart: Marie Haines

Soft justification

How bank IS executives convince management of need for new IS investment

- Service quality: 'We can't respond to customer needs quickly without it.'
- Competitiveness: 'Other banks are providing this service, and we should, too.'
- Comparing cost/quality trade-offs: 'If we spend X, we can achieve this level of quality improvement. If we spend Y, we'll save a little money, but quality levels will be lower.'
- User department involvement: 'The loan origination process will see a 100% efficiency improvement with this proposed system.'

CW Chart: Janell Genovese

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Leaving Ameritech

▶ Slimming down for action, Chicago-based telecommunications player **Ameritech** late last month launched a voluntary retirement program aimed at cutting some 3,000 employees from its management-level rolls. Effects of the streamlining, which would thin Ameritech's management ranks by about 12.6%, should make a major showing on the bottom line beginning in the first quarter of 1992, the company said.

Index founder leaves merged firm

▶ **Intersolv, Inc.** last week announced the resignation of **Richard A. Carpenter** from his posts as vice chairman and chief of strategy and product architecture. The Rockville, Md.-based software house was formed in March when computer-aided software engineering products vendor **Index Technology Corp.** and **Sage Software, Inc.** merged; Carpenter, who founded Index, was chief executive officer of that firm at the time. He will retain his seat on Intersolv's board.

Aries rising

▶ **Software 2000, Inc.**, a business software provider for IBM's Application System/400 computer, has announced a merger with **Aries Software** to provide Aries' Epic process manufacturing system for the AS/400. Hyannis, Mass.-based Software 2000 did not disclose the terms of the merger with privately held Aries, based in Louisville, Ky.

'No mystery' tour

▶ Seagate Technology, Inc. founder/head **Allen Shugart**, newly manning the firm's presidency in the wake of his predecessor's sudden departure [CW, Sept. 30], is about to set off on a world tour of Seagate plants to make clear to employees that their company is on firm footing. His message, according to a company spokesman, will include three key points: Seagate plans no layoffs. It plans no major changes. And it doesn't plan to search for a president. "Shugart is it," the spokesman said. That phrase also answers the question, "Who is the newest director of San Jose-based digital audiotape maker **R-Byte, Inc.**?"

FTC turns up heat on technology firms

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — For several decades, antitrust lawyers at the U.S. Department of Justice have played a role in shaping the computer industry. Witness, for instance, the 1956 Consent Decree with IBM that allowed the computer services industry to flourish and the 1982 Consent Decree with AT&T that let it enter the computer industry and buy NCR Corp.

Now a reinvigorated Federal Trade Commission (FTC), which shares jurisdiction over most antitrust matters, is getting into the act.

FTC investigations of Microsoft Corp. and Intel Corp. have again put the industry on notice that it is not immune to antitrust enforcement.

Price of 'maturity'

The industry may not appreciate the compliment, but the government attention is a sign of maturity. "When the industry was young and small — except for the supergiant IBM — you could do what you pleased and nobody minded," said Esther Roditti Schachter, a computer lawyer in New York.

"But as the industry matures and it's clear to the government that this is an important sector of the economy, even [agencies run by] Republicans begin to pay attention," she said.

Furthermore, the industry is beginning to look like a sector ripe for antitrust abuses, with increasingly aggressive players, financial problems, stagnant markets and commodity products. "If you're in a strong, ebullient market, you don't need to violate the antitrust laws. Everyone can do well," said David R. Kamerschen, an economics professor at the University of Georgia.

For industry players unfamiliar with federal antitrust enforcement, here are the answers to some likely questions:

Has the FTC targeted the computer industry?

Not really. "There is no targeting of any one industry. We bring our cases where we find them," FTC spokeswoman Bonnie Jansen said. FTC investigations are usually triggered by complaints from competitors, consumers or members of Congress, as well as by press reports or activities that arouse the interest of the FTC staff.

Will the investigations spread?

Antitrust investigations often do spread to other companies in an industry, experts said.

"An investigation of one company in an industry makes it more likely that the agency will receive complaints about other companies and that the staff will uncover problems at other companies," said Stephen Calkins, an antitrust expert at Wayne State University in Detroit.

For example, the first company asked about a possible violation may protest that "everybody's doing it," at which point the investigator begins taking down more company names.

What is the FTC looking for?

That is hard to tell because the FTC will neither confirm nor deny that it has any investigation under way, let alone discuss its reasoning.

However, an FTC letter released by Microsoft said the probe was triggered by complaints that Microsoft has monopolized or attempted to monopolize the market for personal computer software, including operating systems and environments [CW, April 15]. In the Intel case, the FTC is apparently looking into the company's powerful role as the sole maker of the popular 80386 microprocessor [CW, July 8].

The key points in antitrust cases are how to define the relevant market and whether the actions were illegal restraints of trade or merely aggressive business practices. "There's an awful lot of robust competition that can occur without any antitrust problems at all. The courts are

Continued on page 118

Who does what

How the U.S. Department of Justice and the Federal Trade Commission divide their authority over antitrust matters in the computer industry

Justice Department	FTC
• Criminal price-fixing cases. • Common carriers, such as AT&T. • Research consortia, such as Microelectronics & Computer Technology Corp., Open Software Foundation and Bellcore.	• Price discrimination cases under the Robinson-Pactman act.

Mergers and acquisitions

Under the Hart-Scott-Rodino Act of 1976, both agencies are formally notified of proposed mergers. They have a formal clearance process to determine which agency will do the full review. For example, the merger of Borland and Ashton-Tate is being reviewed by the Justice Department.

Minor deals such as the 1990 merger of Teradata Corp. and Sharebase Corp. get an abbreviated review.

Other antitrust cases

Both agencies share jurisdiction, with an informal process to determine which one will handle a particular case.

•IBM consent decree (1956) and outsourcing	•Microsoft •Intel

CW Chart: Michael Siggins

Users debate effects of software firm mergers

BY JOHANNA AMBROSIO
CW STAFF

The current bout of software industry mergermania has sparked a debate over whether users ultimately gain or lose when vendors combine.

On the negative side, observers said, customers will have fewer choices and will likely see higher prices for software. The good news is that the surviving vendors will be in a better financial position to support users and to introduce new products.

David Wetmore, president of Goal Systems International, Inc. in Columbus, Ohio, said, "Consolidation benefits the industry and customers because it reduces the misuse of resources. If you're constantly trying to beat each other's brains in, resources are not always spent on reinvesting in the product line."

Goal has made no secret of its intent to grow by acquisition. In the past five years, the firm has scooped up eight companies.

Interested in high prices?

Thomas N. Nies, chairman of Cincinnati-based Cincom Systems, Inc., said, "Divvying up the market among fewer individuals makes them stronger." But, he added, "inevitably, that will lead to higher prices for software, which has been sold at prices far below what it should be. It's hard to tell customers that higher prices are in their best interest, but the vendors who are supporting them will be financially stronger."

Users, for their part, acknowledge both sides of the coin. "Competition is healthy; it leads to better products at competitive prices," said Colby Springer, vice president of IS at Dallas-based Pearle Vision. "But everyone is for sale at the right price. I think that having three to five real alternatives in every market niche is acceptable."

Willard Cecchi, chief executive officer of Blueline Software, Inc. in Minneapolis, said that many users' unwillingness to buy from smaller vendors freezes those suppliers out of the market.

"Many customers have a short list of suppliers," Cecchi noted. "If they don't provide some opportunity for the smaller companies to compete, they're magnifying their own problem."

Charles Wang, chairman of Computer Associates International, Inc. in Garden City, N.Y. — the firm most often seen by industry observers as the great acquisitor — said he foresees an hourglass-shaped industry, with the largest vendors on top and a "dearth" of midsize vendors.

"There will be a flare-out at the bottom of little companies with great technology but that don't have strong service capabilities or a distribution network," Wang said, "and these small companies will always feed the larger ones. Innovation, because it's not capital-intensive, will always be there."

Others said they are not sure where all this will lead. "It's hard to say if consolidation is positive or negative," said Paul Newton, acting executive vice president at Boole & Babbage, Inc.

FTC heat

CONTINUED FROM PAGE 117

becoming increasingly aware that it's important not to stifle hard, indeed brutal, competition," Calkins said.

Why is the FTC, rather than the Justice Department, investigating Microsoft and Intel?

The two agencies share jurisdiction over most antitrust matters and have a "clearance" process to determine which one will handle a particular investigation. The decision rests on such factors as which agency got to the case first and which one has the expertise, inclination and resources to do the investigation.

The Justice Department once covered the technology area by virtue of its IBM and AT&T consent decrees, but recently "the FTC, under the current leadership, has tried to reassert itself in the high-tech areas," said Christopher O. B. Wright, an antitrust attorney at Latham & Watkins in Los Angeles.

Janet D. Steiger, chairman of the FTC for the past two years, is steering away from the Reagan administration's deregulation agenda and stressing enforcement of existing antitrust and consumer protection laws. Steiger's FTC has been investigating "areas of business behavior that were virtually immune during the Reagan administration," said Robert Pitoksky, a former FTC commissioner.

How will the Justice Department and the FTC divide the computer industry?

It is done mostly on a case-by-case basis, often depending on which agency has dealt with a particular company before. Art Amolsch, editor of the "FTC Watch" newsletter in Springfield, Va., speculated that the breakdown may end up this way: The Justice Department will handle IBM-related cases and large systems companies, while the FTC tackles the microcomputer market.

Do investigations stifle innovation?

That is debatable. "Some of these investigations probably aren't going anywhere, but they will make computer and software companies worry about what they're doing and clearing things with lawyers," said David Scheffman, a professor of competitive enterprise at Vanderbilt University in Nashville who worked at the FTC during the Reagan administration. He said the investigations also create uncertainty because the FTC has not clearly stated what it is concerned about.

But Ronald S. Katz, a partner at Coudert Brothers in San Francisco, called such notions "utterly false." He said, "We've had strong antitrust laws for 100 years, and we have had the strongest economy in the history of the world. I think those two facts are related."

What happens next?

The FTC staff will sift through the mass of documents obtained in its fact-finding mission and decide whether to recommend that the commission issue a formal complaint. Often, complaints are settled by both parties via a consent decree, which may require the company to cease and desist certain practices.

Whether the cases become formal complaints or fizzle out, they are already raising the industry's awareness of antitrust law. "There is no doubt that when an agency is active in investigating several companies in an industry, the other companies in that industry would be well-advised to watch their conduct closely," Calkins said.

Defining the lines

The hardest part of an antitrust case involving high-technology companies is determining the "relevant market," which must be defined before anyone can figure out if it is being monopolized.

The U.S. Supreme Court has decided to tackle that issue next year in the case of *Eastman Kodak Co.* v. *Image Technical Services, Inc.*, which will have a major effect on the computer industry. In essence, the court will decide whether the aftermarket for parts and service is a market separate from the market for the original high-tech machine.

Kodak was accused by 18 independent service firms of monopolizing the aftermarket for its copiers after it stopped selling replacement parts to the independents. Kodak said it wanted to ensure that customers got quality service, to protect its reputation and relationship with customers and to prevent the independents from siphoning its service revenue.

The computer industry, seeing many parallels with its business, has filed comments supporting Kodak. The manufacturers argued that buyers of high-tech equipment consider the cost and quality of maintenance and repair services when they choose among systems, so the aftermarket is an integral part of interbrand competition.

Otherwise, the industry will be hit by numerous antitrust suits from independent service firms that are excluded from manufacturers' authorized service programs, commented a spokesman from the Computer and Business Equipment Manufacturers Association.

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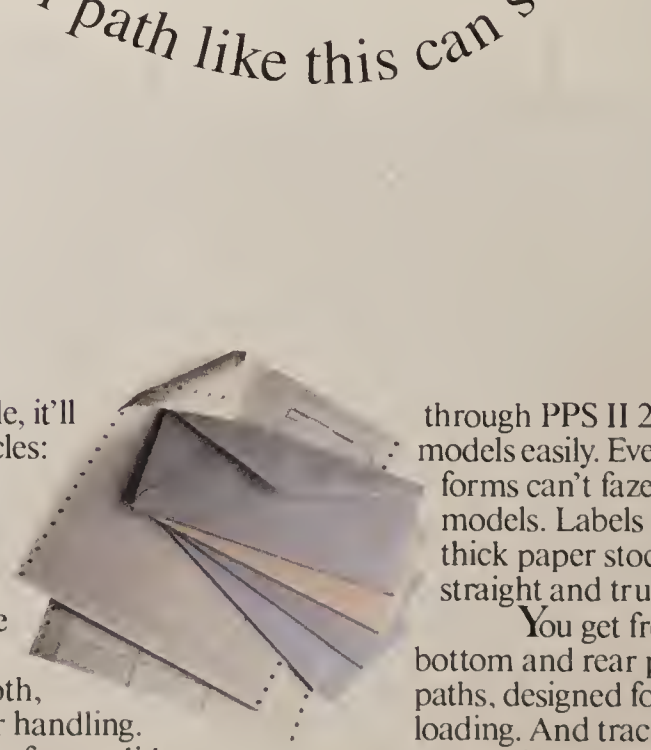

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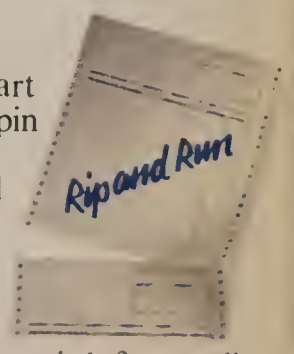

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THE STRAIGHT-PAPER-PATH,

Sun continues to form subsidiaries

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Watching Sun Microsystems, Inc. this year has been like attending a mitosis class in biology. In March, Sun split off two subsidiaries: Sunsoft, Inc., a systems software company, and Sun Technology Enterprises, Inc., created to handle networking, peripherals and development tools.

In mid-September, a telemarketing subsidiary, Sunexpress, opened its doors.

A week later, the formation of three more subsidiaries was announced. Sunpro, a software company with products aimed at developers, Sunconnect, a networking company, and Sunpics, a peripherals company, now make up Sun Technology, which in the process has been relegated to an umbrella company role.

Sunpro primarily sells compilers for Scalable Processor Architecture (Sparc)-based computers. Sparc is Sun's reduced instruction set computing architecture but is licensed to dozens of companies that make competing and compatible workstations. The new Sunpro subsidiary also produces development tools under the label of Sparcworks.

"The business will let developers buy compilers and tools separately," said Jon Kannegaard, general manager of Sunpro.

Sunpro's compiler products will be sold through the recently created Sunsoft; other lines will be handled by Sunexpress and Sun Microsystems Computer Corp., the company's hardware arm.

In addition, Sunconnect is now the arm for creating and marketing network integration software. Its wares will include the likes of Digital Equipment Corp. and IBM connectivity products as well as its parent's Sunnet Manager network administration software.

Sunpics deals in Sun's printing and imaging software and hardware, primarily the Sparcprinter and Newsprint software.

INTERNATIONAL BRIEFS

New grounds

▶ Spurred by its link with Novell, Inc. and projected demand for its newly released DR DOS 6.0 package, **Digital Research, Inc.** is set to open a retail operation in Hong Kong. The firm's Asia Pacific vice president, Richard Dixon, late last month confirmed to the Hong Kong business press that Digital Research will end its absence from the regional market upon its acquisition by Novell, slated to close by the end of this month.

Opening doors

▶ The **European Community Commission** has proposed legislation that will open national public service contracts in the telecommunications, energy, water and transportation sectors to competition from countries throughout and outside the community, according to a recent report in the Belgian business press. The draft directive, which requires approval by the commission's Council of Ministers, will prohibit central and local authorities from discriminating in favor of national firms in the award of service contracts.

Dangling the carrot

▶ While industry observers continue to counsel patience in dealing with the emerging Eastern European market, several recent deals could serve to remind the patient that there are, indeed, rewards. In addition to **NCR Corp.**'s contract to automate the 40,000 branches of the **Russian Savings Bank** — a deal that could be worth $1.5 billion to AT&T's hard-won merger mate — others are busy selling personal computers in the East. Less than a year after its return to Romania, following a 10-year absence, **IBM** has signed on to supply $4.1 million worth of Personal System/2s to the Romanian Ministry of Education and Science.

Into Africa

▶ After years of operating there through distributorship agreements, **Digital Equipment Corp.** has opened its first subsidiary in Africa: **DEC Morocco.** Headed by DEC veteran Jean-Luc Dupuy, the new subsidiary's starting team — including its own sales force — has been largely recruited from among Maghrebian (Morocco, Algeria and Tunisia) professionals. DEC Morocco is headquartered in Casablanca — chosen, according to a company official, for the favorable economic climate for business development.

Steeled for action

▶ Japanese steel manufacturer **NKK Corp.** and Dallas-based supercomputer maker **Convex Computer Corp.** are gearing up to bring their jointly developed Preemptor 5000 supercomputer series to the market by the end of the coming year, according to the companies. The new Preemptors will be the first computer fruits of the NKK/Convex alliance, sealed in 1988. Currently, the companies are co-developing application software and peripherals.

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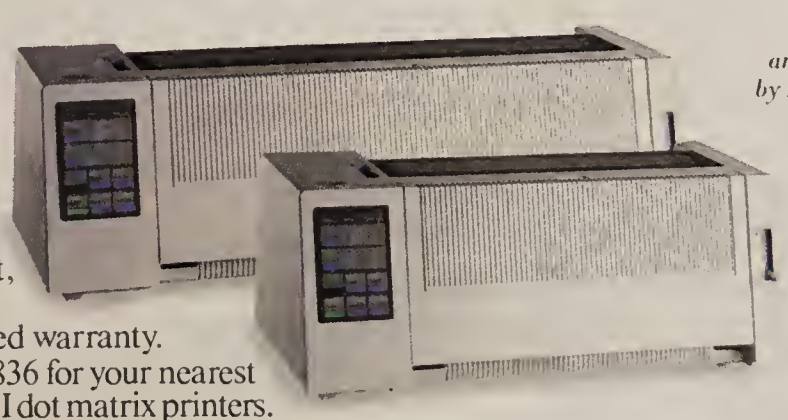

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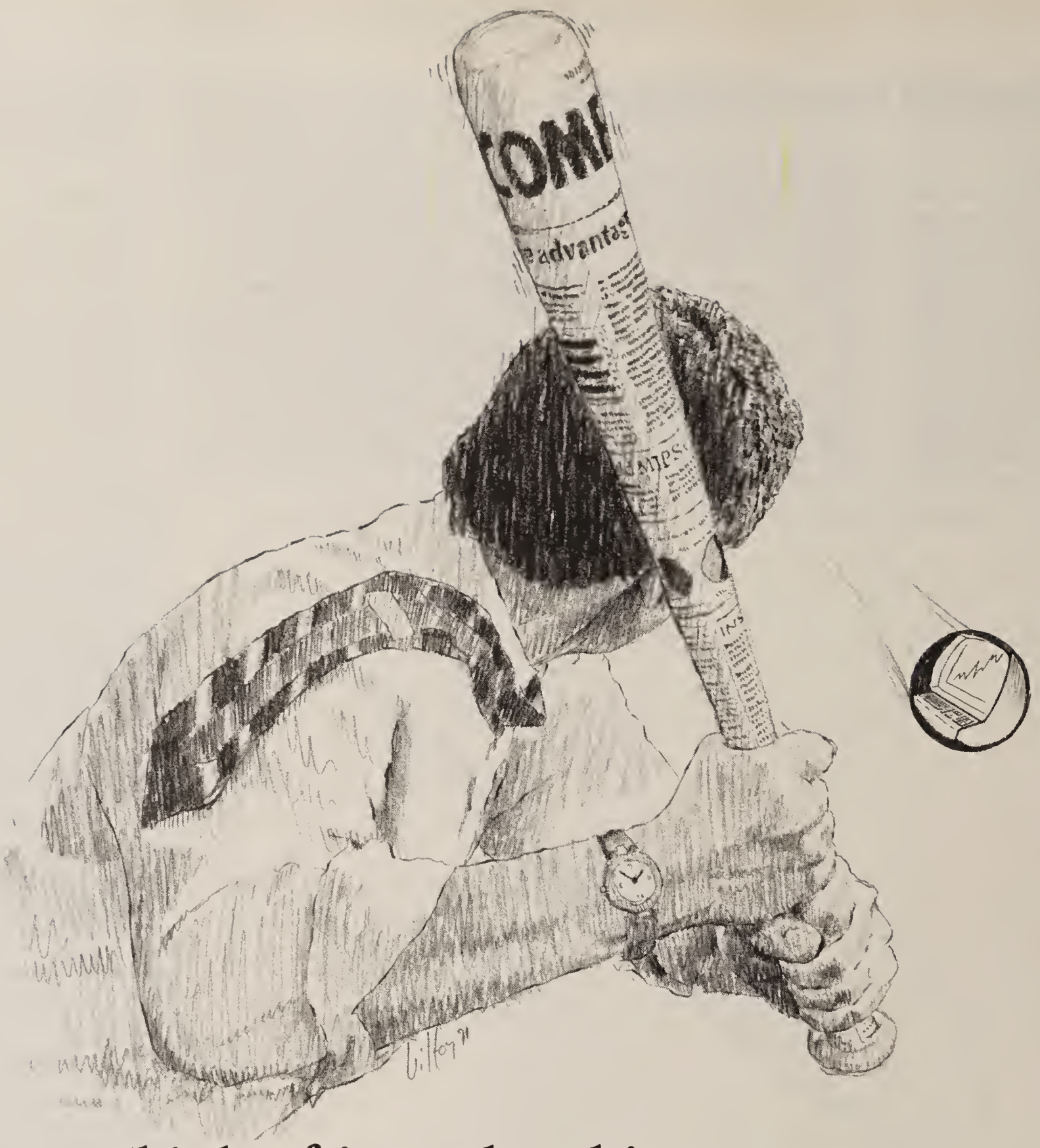

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COMPUTERWORLD

How to rekindle motivational fires

BY JULIA KING
SPECIAL TO CW

Motivating employees saddled with routine work is becoming a significant challenge for information systems managers.

"In the 1970s, IS jobs were very exciting," says Robert A. Zawacki, a University of Colorado researcher and professor of management who has spent the last 16 years studying what motivates IS workers.

Today, by contrast, between 70% and 75% of systems work is maintenance, Zawacki says. More companies are buying applications programs rather than developing them in-house. As they do, IS jobs are getting narrower and less interesting, he adds.

IS professionals have an almost unparalleled need for stimulation — new challenges, job diversity, achievement and recognition — Zawacki says, and jobs are providing less of that all the time.

To counter these effects, some companies have put job rotation, education and training programs into place to help satisfy some appetites for job variety. Other companies have instituted frequent performance appraisals to keep managers better informed of IS workers' job expectations and goals.

Among these organizations is Minneapolis-based Pillsbury Co., where management furnishes IS professionals with a wide range of job challenges and seeks to make IS workers aware of their contributions to the company's overall business success.

"One of the things that hurts motivation the most is when MIS contributions don't get recognized and when IS people don't feel that they are helping drive a company to something further," says Carl Wilson, senior vice president of MIS at Pillsbury.

IS importance

Unfortunately, IS departments at many companies are still regarded as an expense rather than a strategic investment, Wilson says. That was the case at Pillsbury until 1986, when the company came to recognize the MIS department as a "strategic business enabler" and put it on par with other strategic departments, such as marketing and sales, he says.

Among other things, Pillsbury instituted what it calls its "A Day in the Life" program: IS professionals work side by side with workers in other departments to see firsthand what the department's IS needs are and how they can best be met.

However, career enrichment programs and job performance appraisals are only as good as the supervisors and managers who implement them, says Ray Hass, personnel development manager at 3M Co. in St. Paul, Minn., which has a 900-member IS department.

For this reason, 3M provides managers who conduct performance reviews with extensive training in ways to match IS tasks with individual workers' skills and goals. This represents a big change from seven or eight years ago when reviews concerned performance alone, Hass notes.

Prodata, Inc., a computer systems consulting company with 260 IS professionals working in eight cities, also places a heavy emphasis on performance reviews. It is one of the few formal opportunities managers have to communicate with far-flung employees, says Ron Pharis, city manager of the company's office in Boise, Idaho.

In between reviews, Pharis says, Prodata regularly acknowledges IS employees' contributions to the firm in a monthly newsletter, which notes workers' on-the-job achievements and their advances in technical training.

Regular performance appraisals and regular recognition programs help to satisfy IS professionals' needs for both acknowledgement and feedback, according to Zawacki.

Unfortunately, the communications skills inherently required for both of these processes is often sorely lacking in IS managers, he says.

"Many IS managers do a good job of setting goals, and then they disappear into the Bermuda Triangle," Zawacki says. "They're deplorable on feedback — the single biggest motivator."

The solution to this problem, he says, is for companies to train both IS managers and the people they supervise in negotiation and conflict resolution skills, which, in turn, will make them more effective agents of change within their companies.

Wayne Pattison, director of data center operations at Kansas City Southern Railway Co. in Kansas City, Mo., knows firsthand the motivation and productivity benefits good communication skills can afford.

"One of the best things I have been able to do is to let computer operators have some input into the decisions I make concerning them," Pattison says.

Following recent staffing cutbacks at the railway's operations center, for example, Pattison says it was the computer operators, rather than the managers, who determined new schedules for remaining workers.

King is a free-lance technology writer based in Ridley Park, Pa.

Back on track

Here are some tips to help managers motivate IS employees:

- Provide regular job/assignment rotation, including travel assignments.
- Offer frequent performance appraisals.
- Present achievement rewards and incentives.
- Provide in-house training on new systems and applications.
- Rotate systems maintenance work.
- Encourage employees to participate in decisions affecting them.
- Offer separate career paths for IS professionals interested in pursuing business- and technology-oriented jobs.
- Provide forums where IS professionals and employees in other departments can discuss IS requirements and how best to fulfill them.

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INDUSTRY CURRENTS

Job prospects at a low in chemical industry

BY TONY BAER
SPECIAL TO CW

The chemical industry isn't exactly overflowing with career prospects for IS professionals these days. However, those with the right skills and strengths in end-user computing will be able to find some good opportunities.

A year ago, Union Carbide Corp. couldn't make enough chemicals to meet demand, says Ted Smith, corporate systems development manager at the Danbury, Conn., firm. Since then, the recession has switched the supply/demand equation and has resulted in flattened or slightly cut information systems hiring levels.

In many respects, IS hiring and career advancement trends in the chemical industry echo those of business in general. Data centers at the corporate level in the chemical field, just as in the rest of corporate America, have downsized dramatically over the past five years, with more personnel being transferred either to another division or business-unit level.

The area most affected by the recession is the Mid-Atlantic region — roughly New York, New Jersey, Eastern Pennsylvania, Delaware and Maryland. Hiring activity in this region, noted to be the heart of much of the nation's chemical production, is at an all-time low, according to Jim Combs, regional IS placement manager at Robert Half International, Inc. in Philadelphia. He attributes much of that to layoffs resulting from both long-term restructuring and short-term retrenchment from the industry's down cycle.

Most hiring taking place in the depressed chemical industry is at consultancies — not at the chemical firms, Combs says.

But some managers and recruiters report a shortage of professionals skilled in workstations, Unix, SQL databases, computer-aided software engineering (CASE) technologies and personal computer local-area networks. Unix and SQL database backgrounds are particularly important for the design and management of industrial process control systems, says Chick Bisberg, a recruiter at Two-Party Systems, Inc. in New Jersey.

In addition, employers are also on the lookout for IS professionals with a strong business acumen — particularly those skilled in end-user computing. These professionals must also have a keen eye for the bottom line, especially when it comes to judging which applications or systems will truly add value or competitive edge to the business.

"A hire today must not only be good technically but also be able to work with users," says Rob Lincoln, administrative services/human resources director at The Dow Chemical Co. Although Lincoln looks for professionals with degrees in IS, he adds that business and psychology minors can't hurt.

Most hires at Rohm & Haas Co. in Philadelphia are in business units, not in a centralized IS organization, thereby increasing the mix of MBA computing types. Bill Hensinger, corporate IS manager, adds that the trend is toward buying off-the-shelf applications, not programming from scratch. Nevertheless, there is still some demand for traditional Cobol programmers.

Business-oriented IS professionals can definitely gain an edge in the chemical industry — but only if they're open to change, says Len Cohn, the vice president who oversees corporate IS for Monsanto Corp. in St. Louis. "People practicing IS must be prepared to discard old notions when something better comes along."

That's especially critical given the current downsizing climate. For instance, Monsanto has been gradually downsizing its corporate data center. Since the mid-1980s, corporate IS has been reduced 95%.

Currently, the company is actively hiring in value-added areas such as pharmaceuticals rather than the more mature, less profitable commodity chemical side.

Baer is a free-lance writer based in New York.

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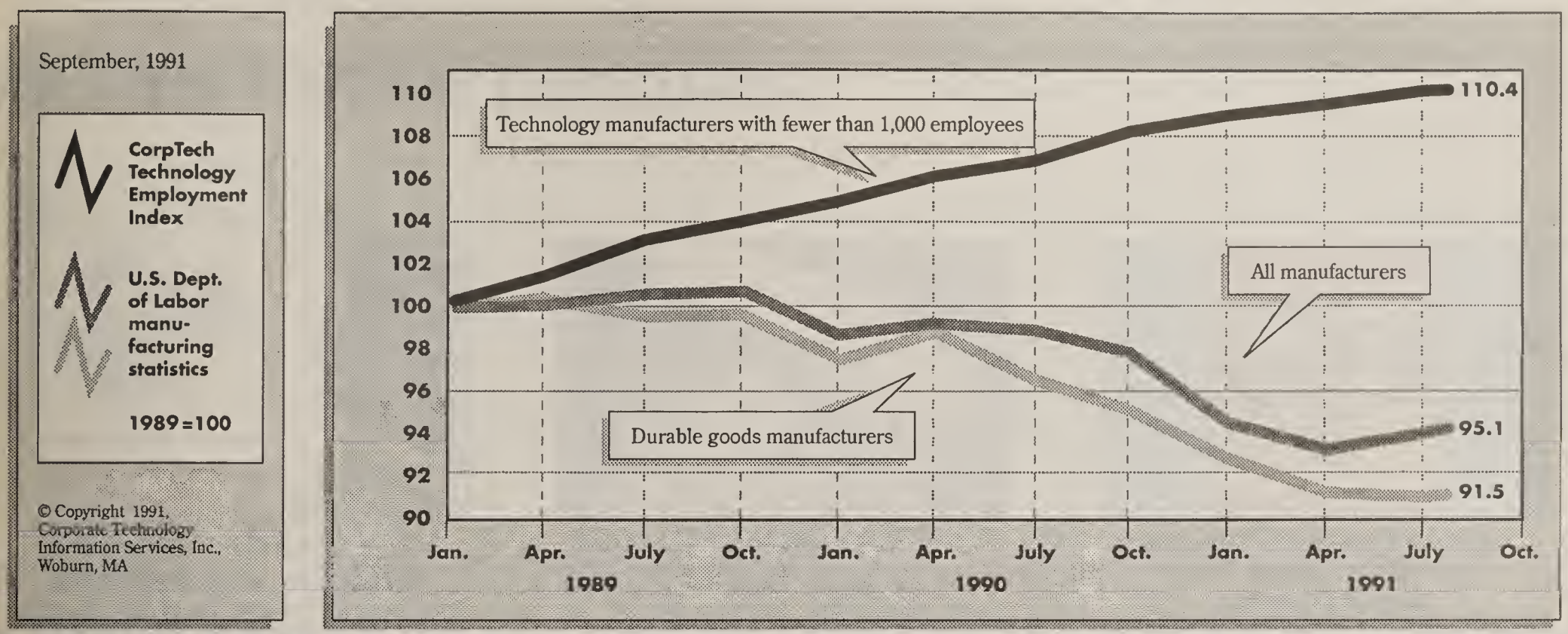

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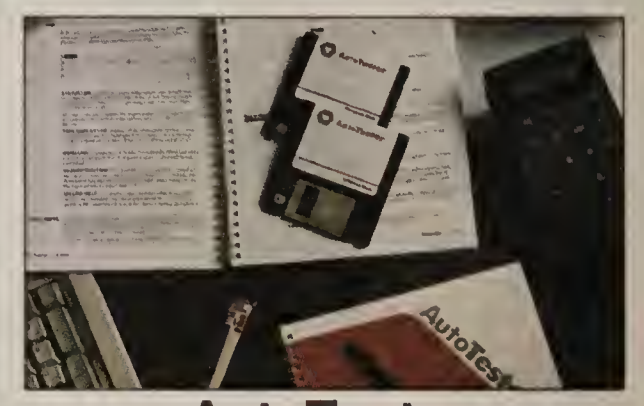

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Making way for portables

IS managers get hopping on standardization issues to meet users' needs

BY ALAN RADDING
SPECIAL TO CW

Just when information systems managers thought they had desktop personal computer purchases under control, users want more. Managers now find themselves wrestling with standardization issues for laptops and portables.

Once topping managers' lists of concerns was the size and weight of portables. But yesterday's boxy, 22-pound luggables have given way to today's slim, 8- to 15-pound laptops, 4- to 8-pound notebooks and even lighter handheld computers. New priorities include such features as CPU speed, memory, storage, communications/networking and display screens.

However, one central issue is whether the portable computer will be the user's only computer — on the road and in the office. With power increasing and prices falling for laptops, organizations can duplicate the power of a desktop in a slim, lightweight portable at only a small premium over the cost of a desktop system — and certainly less than the cost of two systems.

"We're buying the same power in a portable as on the desk . . . We don't want to buy people two machines," says Sheldon Laube, national director of information and technology at Price Waterhouse in New York. The company's portable standard is now a 20-MHz 80386SX with 60M bytes of storage and a 9.6K-bit/sec. modem.

Even if managers decide against duplicating the desktop in a portable, they will still want to maintain a consistent operating environment across the desktop and portable. That includes Microsoft Corp.'s Windows 3.0, which raises the ante in portable computers just as it has in desktop systems.

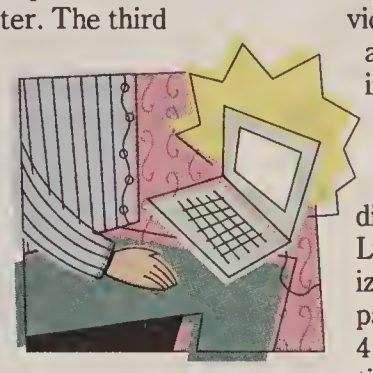
Desktop duplicate

"People want the same operating environment in their portable as they have in their desktop," says Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn. Users who run under Windows at the office won't want to run under DOS on the road.

As a result, sales of 80386SX-based portables with 1M to 2M bytes of memory, a 20M- to 40M-byte hard disk and an IBM Video Graphics Array (VGA)-compatible screen — the minimum configuration necessary to run Windows reasonably well — are taking off, Fiering reports. And most organizations opt for more memory and more storage.

But how much power users need in a laptop or portable computer depends largely on how the machine is being used. The Gartner Group classifies portable computer users into three groups, each requiring a different level of power and performance, Fiering says.

The first group is utility/convenience users. They require only a limited subset of a desktop computer's capabilities. The second group — the majority of users — includes those who expect most but not all the capabilities of the desktop computer. The third group consists of those whose office is wherever they happen to be. "These people need to replicate the desktop system in the field," Fiering says.



With the cost of processors, memory and storage dropping, some managers prefer to buy as much as they can afford rather than try to match the requirements of individual users.

"Speed is cheap, so you might as well get an 80386. And disk drive capacity is cheap, so you can afford to boost storage," says Bard White, MIS director at Spalding Sports Worldwide.

Spalding equips its field sales force with portable PCs running Lotus Development Corp.'s 1-2-3, word processing and communications packages. The company's original laptops were 80286-based Compaq Computer Corp. boxes with 40M bytes of storage and a modem. Today, White buys 80386-based laptops and expects to move to I486-based machines in the not-too-distant future. "It depends on the cost, of course, but if the cost differential is small, we'll go with the fastest we can get."

Display is another key issue. Some users prefer more powerful machines, such as 20-MHz, 80386SX- and 80386-based systems, because they typically come with better screens, says Mike Droluk, information services officer at Reliance Insurance Co. in Philadelphia.

Because Windows requires better screen display, Coopers & Lybrand standardized on a VGA-compatible (640- by 480-pixel resolution) monochrome display, according to Stephen Rood, formerly the microcomputer manager there and now head of Rood & Associates in Ossining, N.Y. "We looked at color, but it was a little pricey. Most users were willing to give up color if the resolution was there," he adds.

Communications features were once considered options but are now virtually standard on portables. Still, the speed of the modem is an issue. Blue Cross/Blue Shield of Massachusetts uses a 2,400K bit/sec. modem, but "we'd be better off with a higher speed modem, 9.6K bit/sec., V.32 class," says John Thibodeau, team leader for information delivery.

The V.32 specification describes a data modem. Many of the 9.6K bit/sec. modems going into portables are fax modems. They transmit at 9.6K bit/sec. for fax but at a slower rate for data. "A 9.6K bit/sec. fax modem is really limited," Thibodeau says, but the high-speed (V.32) data modems are considerably more expensive.

Source of savings

Spalding's White opts to save money on the modem: "We include a built-in modem, but we don't need fast ones." Consequently, Spalding buys only a 1,200 bit/sec. modem. The sales force uses the modems for minimal message sending.

Managers must also consider network communications. "We use a Xircom pocket connector so [laptop users] can hook up to the network," Thibodeau says.

However much speed, memory, storage, communications and display capability IS managers standardize on for portables, they shouldn't expect the issue to stay resolved for long, Fiering warns. "We've found the acceptable life for laptops is 24 months before users feel the laptops are too heavy and too slow." That compares with a three- to five-year acceptable life span for desktop systems.

Radding is a free-lance writer in Newton, Mass.

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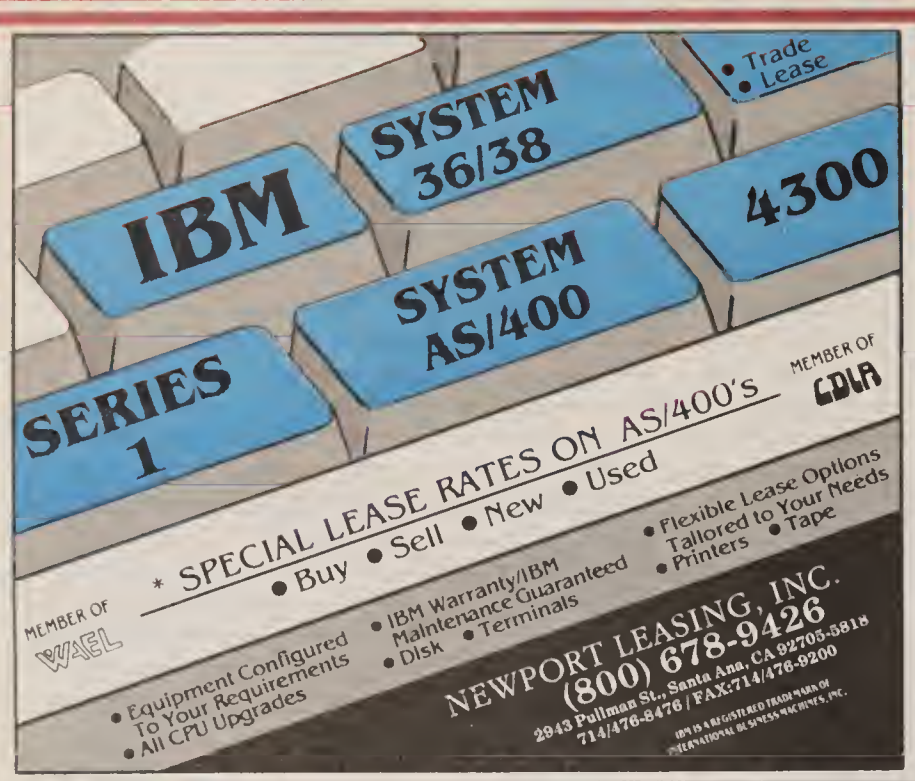

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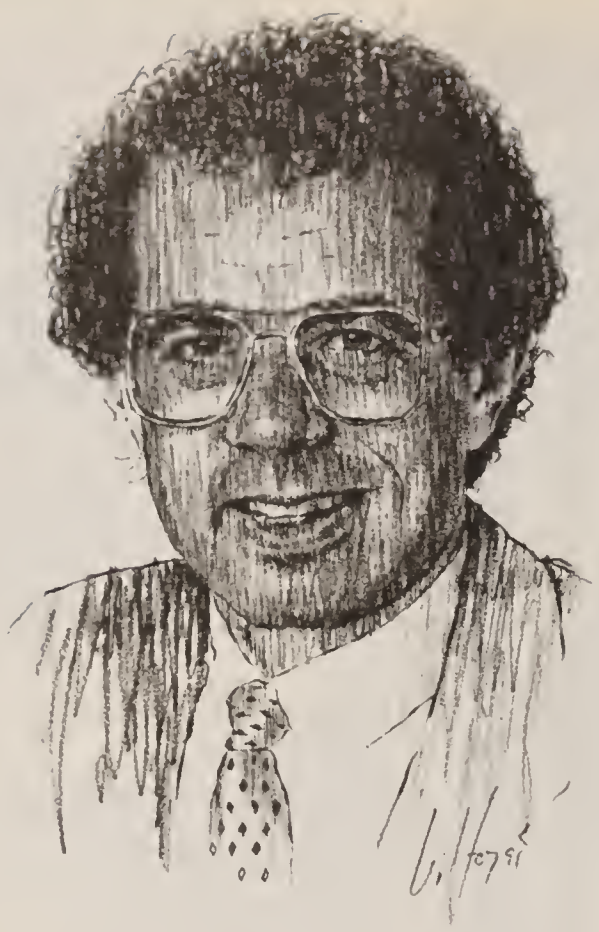

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UNITED KINGDOM: Colin Smith, Oliver Smith & Partners, 18 Abbeville Mews, 88 Clapham Park Road, London SW4 7BX, United Kingdom. Phone: (011) 44 1 978 1440. FAX: (011) 44 1 978 1550.

VENEZUELA: Kalman von Vajna Nagy, IDG Comunicaciones C.A., Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela Phone: (011) 58 2 72 76 30. FAX: (011) 58 2 724970.

WEST GERMANY: Eckhard Utpadel, IDG Communications Verlag AG, Rheinstrasse 26/28, Postfach 40 04 29, 8000 Munich 40, West Germany. Phone: (011) 49 89 360860. Telex: (851) 5215350. (COMW 0). FAX. (011) 49 89 3 60 86257.

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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

UPGRADED FROM ATTRACTIVE TO BUY: **Microage, Inc.** (Mabon Securities Corp.). Earnings for the next few quarters should continue to improve, correlating with greater demand for personal computers late this year and in early 1992. New products expected this month from **Apple Computer, Inc.** could stimulate end-user demand. Microage has capitalized on merger action in the PC retailer business by stepping into big corporate accounts left unattended by other stores.

NEW COVERAGE

INITIAL RATING OF HOLD: **Synoptics Communications, Inc.** (Prudential Securities, Inc.). The company leads the market for local-area network wiring hubs, which are hardware devices that help users manage the physical layer of networks. The market is expected to grow 25% to 40% per year for the next few years.

Increasing competition among Ethernet hubs — Synoptics' biggest money maker — is cause for concern. Profitability will suffer at the hands of rivals **Chipcom Corp., Ungermann-Bass, Inc.** and **Cabletron Systems, Inc.** (see below). Synoptics will see lower profit margins for the next six to 12 months, not the 25% pretax margins it has enjoyed. Unlike Cabletron, which sells directly to end users, Synoptics uses multiple sources, including direct, value-added resellers, systems integrators and distributors. Often, Synoptics representatives sell against one another at the same account, undercutting one another's prices.

INITIAL RATING OF BUY: **Cabletron** (Prudential). The company is closing the gap between itself and hub market leader Synoptics. Cabletron as a whole is more profitable than Synoptics, thanks in part to Spectrum, network management software introduced in September 1990. Cabletron's direct sales approach works well. The 12-month target stock price is $55 to $60.

ANALYSIS IN BRIEF

Industry update: Personal computers
Prudential, Sept. 26.

August sales results threw cold water on what looked to be the first signs of an upturn in the U.S. PC market. Unit sales fell 17% in August after rising 11% in July. Dollar sales plunged 35% in August, as the average selling price per PC dropped 21%.

Demand for **IBM**'s and **Compaq Computer Corp.**'s 80386SX and 80386DX machines waned because of anticipated new products and associated price cuts. Although Apple's sales normally pick up as the school season nears, unit sales fell 23% in August vs. July. Summertime winners were the clones, whose unit share jumped 15% and whose dollar share surged 20%.

Workstation update
Bear, Stearns & Co., Sept. 27.

New servers recently introduced by **Sun Microsystems, Inc.** helped plug the gap in the firm's high-end line. Also, Sun will clearly benefit from the lack of low-end systems from IBM and **Hewlett-Packard Co.**

Meanwhile, **Mips Computer Systems, Inc.** unveiled a new semiconductor, the R4000, last week. Five other semiconductor companies will help Mips manufacture the chip. Introduction of the R4000 enables Mips and other vendors in the Advanced Computing Environment consortium to stick to new product schedules next year.

KIM S. NASH

STOCK TRADING INDEX

THIS WEEK'S HIGHLIGHTS

- Technology shares were battered last week. Knowledgeware, Inc. plummeted 5¾ points, or 31%, to 13 after announcing weak first-quarter results. Conner Peripherals, Inc. slid 3⅝ points to 15⅞ after it said profits will slip for the current quarter.
- IBM and Apple Computer, Inc. outlined plans last week for a joint venture. Both stocks fell. IBM lost 5⅞ points for the week, closing Thursday at 99, and Apple sank 2¼ points to 47¾.
- Among top gainers, Borland International, Inc. soared 4⅜ points to 49¾ after favorable speculation about the copyright infringement case brought against it by Lotus Development Corp. Lotus fell 4 points to 26¾.
- Picturetel Corp. added 1¾ points, rising to 35. Intersolv, Inc., which appointed a new chief financial officer last week, inched up ⅛ of a point to 11.
- Compaq Computer Corp. — trading near its 52-week low — lost 2¼ points to 31½.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, OCTOBER 4, 1991

TOP PERCENT GAINERS

System Center Inc.	22.95
Wang Labs Inc. (b)	20.00
Sequent Computer Sys.	20.00
EMC Corp.	18.37
Legent Corp.	16.07

TOP PERCENT LOSERS

Knowledgeware Inc.	-36.18
Intellicorp Inc.	-22.22
Data Switch Corp.	-21.41
Rexon Inc.	-19.30
Lotus Development	-15.63

TOP DOLLAR GAINERS

Legent Corp.	4.50
Borland Int'l	4.25
Matsushita Electronics	4.00
Policy Management Sys.	2.63
Adobe Systems Inc.	2.50

TOP DOLLAR LOSERS

Knowledgeware Inc.	-6.88
Lotus Development	-5.00
Cray Research Inc.	-3.75
Motorola Inc.	-3.75
IBM	-3.75

Exch	52-Week	Range		Oct. 4 Close	Wk Net Change	Wk Pct Change
Communications and Network Services			**Off 3.25%**			
OTC	10.50	5.38	3 COM Corp.	9.13	0.38	4.29
NYS	69.75	55.75	American Info Techs Corp.	59.50	-2.00	-3.25
NYS	40.38	29.00	AT&T	36.38	-1.25	-3.32
OTC	4.13	0.88	Artel Communication Corp.	1.50	-0.25	-14.29
NYS	56.25	43.25	Bell Atlantic Corp.	43.25	-2.00	-4.42
NYS	56.25	46.13	Bellsouth Corp.	48.75	-0.75	-1.52
NYS	52.88	17.00	Cabletron Systems	48.63	0.13	0.26
OTC	25.88	8.25	Compression Labs Inc.	20.00	-1.88	-6.57
OTC	5.13	2.06	Data Switch Corp.	2.06	-0.56	-21.41
NYS	21.50	8.88	Digital Comm. Assoc.	15.38	0.13	0.82
OTC	25.25	12.25	Dynatech Corp.	15.00	-0.50	-3.23
OTC	12.38	5.00	Fibronix Int'l Inc.	6.25	-0.75	-10.71
OTC	3.75	2.00	Gandalf Technologies Inc.	2.50	-0.25	-9.09
NYS	3.50	1.63	General Datacomm Inds.	2.63	0.00	0.00
NYS	33.50	28.13	GTE Corp.	30.63	0.13	0.41
NYS	83.00	40.25	ITT Corp.	55.50	0.25	0.45
OTC	33.75	17.88	MCI Commmunications Corp.	27.88	-1.25	-4.29
OTC	11.00	2.75	Microcom Inc.	11.00	0.38	3.53
NYS	13.75	4.00	Network Equipment Tech.	11.63	-0.88	-7.00
OTC	14.38	4.50	Network General	13.13	-1.13	-7.89
OTC	18.88	8.13	Network Systems Corp.	16.75	-0.63	-3.60
NYS	41.00	22.63	Northern Telecom Ltd.	39.38	0.00	0.00
OTC	39.63	8.63	Novell Inc.	37.25	-0.25	-0.67
NYS	77.63	67.00	Nynex Corp.	76.00	-1.00	-1.30
NYS	47.00	38.50	Pacific Telesis Group	41.00	-0.88	-2.09
OTC	11.63	3.63	Penril Data Comm. Ntwks.	8.50	-0.50	-5.56
OTC	35.50	8.25	Picturetel Corp.	34.75	1.75	5.30
NYS	17.88	8.88	Scientific Atlanta Inc.	13.63	0.13	0.93
NYS	57.75	49.00	Southwestern Bell Corp.	55.25	0.25	0.45
NYS	31.50	20.63	United Telecom	23.88	-1.13	-4.50
NYS	40.75	34.00	US West Inc.	35.00	-0.13	-0.36
Computer Systems			**Off 2.54%**			
OTC	20.75	4.50	Advanced Logic Research	11.75	-0.75	-6.00
ASE	17.88	10.38	Amdahl Corp.	13.88	0.50	3.74
OTC	73.25	24.25	Apple Computer Inc.	48.25	-0.75	-1.53
OTC	9.13	2.75	Archive Corp.	3.00	-0.50	-14.29
OTC	32.75	7.50	AST Research Inc.	28.75	-0.63	-2.13
NYS	9.38	4.00	Bolt, Beranek & Newman	6.13	-0.25	-3.92
NYS	21.63	5.38	Commodore Int'l	12.63	0.13	1.00
NYS	74.25	29.88	Compaq Computer Corp.	31.38	-3.13	-9.06
OTC	2.50	0.38	Computer Automation Inc.	1.38	-0.13	-6.33
NYS	13.75	6.75	Control Data Corp.	9.50	-0.38	-3.80
NYS	19.75	8.38	Convex Computer	10.38	-0.88	-7.78
NYS	44.50	20.00	Cray Research Inc.	38.75	-3.75	-6.82
NYS	22.38	3.50	Data General Corp.	18.63	-2.75	-12.87
NYS	4.38	1.00	Datapoint Corp.	4.00	-0.13	-3.03
OTC	38.25	8.25	Dell Computer Corp.	30.75	-1.25	-3.91
NYS	83.00	45.50	Digital Equipment Corp.	53.63	-2.88	-5.09
NYS	28.88	13.75	Harris Corp.	22.63	0.00	0.00
NYS	56.63	24.88	Hewlett Packard Co.	46.88	-2.13	-4.34
NYS	139.75	94.00	IBM	98.38	-3.75	-3.67
OTC	12.00	7.75	Information Int'l	8.75	-0.75	-7.89
NYS	149.00	106.00	Matsushita Electronics	120.25	4.00	3.44
OTC	20.88	7.25	MIPS Computer Systems	11.38	-0.75	-6.19
NYS	110.00	44.50	NCR Corp.	108.00	0.00	0.00
OTC	29.50	10.75	Pyramid Technology	14.75	-1.25	-7.81
OTC	20.25	7.50	Sequent Computer Sys.	10.50	1.75	20.00
NYS	47.25	18.00	Silicon Graphics	42.50	-0.25	-0.58
NYS	40.75	14.63	Stratus Computer Inc.	39.13	1.75	4.68
OTC	38.63	15.00	Sun Microsystems Inc.	27.88	-2.13	-7.08
NYS	17.63	8.88	Tandem Computers Inc.	12.13	-0.50	-3.96
NYS	36.50	23.38	Tandy Corp.	28.63	0.88	3.15
OTC	24.50	6.75	Teradata	21.00	0.00	0.00
OTC	4.75	1.25	Tandon Corp.	2.06	-0.06	-2.92
NYS	6.13	1.38	Ultimate Corp.	2.88	0.00	0.00
NYS	7.00	1.75	Unisys Corp.	4.38	-0.50	-10.26
ASE	5.75	2.00	Wang Labs Inc. (b)	3.00	0.50	20.00
Software & DP Services			**Off 0.19%**			
OTC	63.00	17.00	Adobe Systems Inc.	52.75	2.50	4.98
OTC	12.25	3.50	Alcorp	5.38	-0.38	-6.52
OTC	59.88	21.00	Aldus Corp.	40.88	0.88	2.19
OTC	28.50	13.38	American Mgmt. Systems	21.75	-0.63	-2.79
OTC	17.25	7.50	American Software Inc.	13.88	-0.38	-2.63
NYS	4.63	1.38	Anacomp Inc.	3.13	-0.13	-3.85
OTC	18.25	10.25	Analysts Int'l	14.25	1.00	7.55
OTC	18.63	5.13	Ashton Tate	15.75	0.75	5.00
OTC	13.00	4.00	ASK Computer Sys.	11.75	-0.50	-4.08
NYS	37.00	22.63	Auto Data Processing	35.00	1.13	3.32
OTC	82.25	32.00	Autodesk Inc.	48.00	-2.25	-4.48
OTC	35.50	18.50	BGS Systems Inc.	33.75	-0.25	-0.74
OTC	55.00	17.75	BMC Software Inc.	50.25	-1.75	-3.37
OTC	16.00	8.75	Boole & Babbage Inc.	10.25	0.75	7.89
OTC	64.25	18.50	Borland Int'l	50.00	4.25	9.29
OTC	20.88	5.13	Cognos Inc.	16.75	0.38	2.29
NYS	11.13	5.00	Computer Associates	7.75	-0.25	-3.13
OTC	17.75	9.50	Computer Horizons	10.50	-1.50	-12.50
NYS	73.25	38.25	Computer Sciences	64.75	0.00	0.00
NYS	11.25	6.63	Computer Task Group	7.88	-0.75	-8.70
OTC	22.75	13.00	Comshare Inc.	18.75	0.50	2.74
OTC	13.25	3.75	Corporate Software	9.50	0.38	4.11
NYS	52.25	31.25	General Motors E (EDS)	47.75	1.00	2.14
OTC	18.75	7.25	Goal Systems Int'l	12.75	-0.75	-5.56
OTC	7.00	1.88	Hogan Systems Inc.	5.63	0.00	0.00
OTC	29.25	7.75	Information Resources	27.25	-1.50	-5.22
OTC	9.00	2.63	Informix Corp.	9.00	1.13	14.29
OTC	3.63	1.38	Intellicorp Inc.	1.75	-0.50	-22.22
OTC	31.50	10.50	Intergraph	18.88	-0.13	-0.66
OTC	8.25	2.75	Interleaf Inc.	7.25	0.38	5.45
OTC	12.25	6.88	Intersolv	10.75	-0.13	-1.15
OTC	43.25	10.00	Knowledgeware Inc.	12.13	-6.88	-36.18
OTC	45.00	16.75	Legent Corp.	32.50	4.50	16.07
OTC	40.75	12.50	Lotus Development	27.00	-5.00	-15.63
OTC	19.00	9.00	Mentor Graphics	13.50	0.75	5.88
OTC	32.00	9.75	Micrografx	14.75	-1.50	-9.23
OTC	90.00	35.75	Microsoft Corp.	88.13	-0.13	-0.14
NYS	15.75	4.00	On Line Software Int'l	15.75	0.00	0.00
OTC	14.13	4.88	Oracle Systems	13.75	0.25	1.85
NYS	16.00	7.00	Pansophic Systems	15.63	-0.13	-0.79
OTC	10.00	1.25	Phoenix Technologies	7.50	0.38	5.26
OTC	19.75	9.00	Platinum Technology	18.50	1.13	8.47
NYS	56.13	33.38	Policy Management Sys.	56.13	2.63	4.91
NYS	25.75	11.50	Reynolds & Reynolds	25.38	-0.13	-0.49
OTC	13.75	8.75	Ross Systems	12.75	0.00	0.00
OTC	27.50	15.00	SEI Corp.	27.25	0.25	0.93
OTC	23.38	13.88	Shared Medical Systems	21.75	-0.75	-3.33
OTC	35.25	12.00	Software Publishing Corp.	18.50	0.63	3.50
NYS	16.75	5.88	Sterling Software	15.50	0.88	5.98
OTC	18.25	9.50	Sungard Data Sys.	14.75	-0.25	-1.87
OTC	68.50	17.75	Symantec Corp.	62.50	-3.25	-4.94
NYS	10.63	4.50	System Center Inc.	9.38	1.75	22.95
OTC	37.25	12.50	System Software Assoc.	22.00	1.00	4.78
Semiconductors			**Off 4.40%**			
NYS	14.25	3.63	Advanced Micro Devices	9.00	-0.50	-5.26
NYS	12.50	5.50	Analog Devices Inc.	7.13	-0.50	-6.56
OTC	13.50	5.25	Chips & Technologies	8.38	-0.75	-8.22
OTC	59.25	28.00	Intel Corp.	40.00	-2.25	-5.33
NYS	12.50	5.25	LSI Logic Corp.	7.00	0.00	0.00
NYS	19.13	8.75	Micron Technology	14.63	0.00	0.00
NYS	71.25	45.75	Motorola Inc.	56.75	-3.75	-6.20
NYS	8.38	3.00	National Semiconductor	4.25	0.00	0.00
NYS	47.63	22.50	Texas Instruments	28.25	-0.75	-2.59
OTC	12.25	3.00	VLSI Technology	6.63	-0.38	-5.38
OTC	16.75	4.75	Weitek	6.13	-0.63	-9.26
ASE	6.75	2.50	Western Digital Corp.	3.00	-0.13	-4.00
Peripherals & Subsystems			**Off 1.77%**			
OTC	2.75	0.88	Apertus Technologies	1.44	0.00	0.00
OTC	14.75	7.50	Banctec Inc.	14.50	0.25	1.75
OTC	21.75	4.25	Cambex Corp.	19.25	0.00	0.00
ASE	11.75	4.75	Cognitronics Corp.	7.88	0.25	3.28
NYS	31.25	14.63	Conner Peripherals	18.63	-2.75	-14.19
ASE	16.00	7.00	Dataram Corp.	15.50	1.25	8.77
NYS	13.00	4.88	EMC Corp.	7.25	1.13	18.37
NYS	47.25	33.75	Eastman Kodak Co.	42.13	-0.13	-0.30
OTC	11.25	4.75	Emulex Corp.	5.63	-1.00	-15.09
OTC	24.00	14.00	Evans & Sutherland	16.88	0.13	0.75
OTC	7.44	3.88	Iomega Corp.	7.44	0.56	8.19
OTC	28.25	8.00	IPL Systems Inc.	22.50	0.75	3.45
OTC	6.25	1.63	Maxtor Corp.	4.56	-0.06	-1.34
OTC	18.00	5.00	Micropolis Corp.	6.00	-0.50	-7.69
NYS	97.50	73.63	3M Corp	89.25	-0.88	-0.97
OTC	10.75	8.00	Printronix Inc.	6.25	-0.25	-3.85
NYS	24.75	8.50	QMS Inc.	23.63	0.63	2.72
OTC	18.25	8.25	Quantum Corp.	10.50	-0.63	-5.62
NYS	7.63	4.38	Recognition Equipment	8.63	0.38	6.00
OTC	11.50	4.00	Rexon Inc.	5.75	-1.38	-19.30
OTC	19.88	5.63	Seagate Technology	7.63	-0.50	-6.15
NYS	51.50	11.25	Storage Technology	41.50	-2.63	-5.95
NYS	30.88	13.50	Tektronix Inc.	23.88	-1.25	-4.98
OTC	0.53	0.16	Televideo Systems	0.25	-0.03	-11.03
NYS	62.13	29.00	Xerox Corp.	61.13	0.13	0.20
Leasing Companies			**Up 1.21%**			
OTC	18.25	7.00	Amplicon Inc.	15.25	0.25	1.87
NYS	28.38	14.75	Comdisco Inc.	20.25	0.63	3.18
OTC	15.75	8.88	LDI Corporation	14.50	0.00	0.00
OTC	4.50	2.25	Selecterm Inc.	4.25	0.00	0.00

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Rumor mill stirring at Prime

ANALYSIS

BY SALLY CUSACK
CW STAFF

BEDFORD, Mass. — Change is in the wind at Prime Computer, Inc., but the million-dollar question is, what kind of change, and when will it occur? Definitive answers are eluding both analysts and users.

Since venture capitalist and leveraged buyout firm J. H. Whitney & Co. rescued it from a hostile takeover attempt two years ago, Prime's minicomputer business has run up significant losses as proprietary customers defect to other platforms.

D. R. Holdings, Inc. in Delaware reported a loss totaling $352 million in the second quarter of 1991. D. R. Holdings is the holding company established by J. H. Whitney to manage its Prime acquisitions.

Meanwhile, Computervision — seen as the weak sibling when acquired by Prime in 1988 — has been successful in the computer-aided design and manufacturing marketplace.

"There is a strong sense of activity surrounding Computervision," said Kathey Hale, senior analyst at Dataquest, Inc. in San Jose, Calif. "There are all kinds of rumors flying about."

However, Hale added, "At a certain point, the activity is so high, there is no sense in trying to call the outcome."

What's in store

Customers, analysts and insiders seem to agree on the following as the most likely outcomes:

- J. H. Whitney could take Computervision public before the end of the year, if possible. Computervision is currently Sun Microsystems, Inc.'s largest OEM customer, and its recently announced Cadds 5 software has been generally lauded by analysts as state of the art in the mechanical computer-aided design marketplace.
- J. H. Whitney could try to sell the minicomputer systems business. Rumored buyers include Hewlett-Packard Co., Data General Corp. and Digital Equipment Corp. Most Prime customers run in a Pick-like software environment, and recompiling these applications to HP or DG Pick platforms would be relatively easy, analysts said.

IBM may also purchase a port of Prime's Information database software to the RISC System/6000 platform — a project that has already been completed within Prime.

- Both the Computervision business unit and the Prime Service unit could go public, with the latter emerging as a third-party maintenance company.

It has also been rumored that HP would look to purchase a port of the Cadds 5 software for the HP 700 workstation platform, in addition to possibly purchasing the minicomputer business. Shao Wang, vice president at Smith Barney, Harris Upham & Co. in New York, said he would be surprised if HP were involved in this type of arrangement.

Russell E. Planitzer, chairman of D. R. Holdings, has said on record that he would like to do a public offering or some type of private financing arrangement for the company.

IBM, Apple

FROM PAGE 1

anything," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Co. in Sunnyvale, Calif. "Maybe later on it will, but only then if they get a lot of user input when they create the products. Ultimately, they may design something that users don't want."

Sculley: *'We're trying to take the industry to a new level of technologies'*

Other users didn't seem bothered by the delay in the products, which aren't scheduled to begin arriving for two to four years.

"We've just upgraded our Macs, so our next big wave of purchasing is still several years off, probably around when these things first start to arrive," said Rick Christjansen, manager of technical support at Manville Corp. in Denver.

In the long term, the pact could also radically alter the power structure in the PC industry. Apple and IBM now face severe challenges from Microsoft Corp., which has swiftly caught up with both vendors technologically and is promising to carve out huge chunks of burgeoning areas such as multimedia and pen-based computing. Both Apple and IBM "are riding each other's back into areas they both want and need to be," said Michelle Preston, an analyst at Cowen & Co.

"We're trying to take the industry to a new level of technologies that are too expensive for any of us to develop on our own," Sculley said. However, both companies will continue to "vigorously compete" in their proprietary hardware product lines, according to IBM President Jack Kuehler.

One joint venture will develop an advanced operating system based on object-oriented technology, which streamlines development work by allowing portions of old programs to be reused.

The company, called Taligent, will be located in the Silicon Valley and will base its efforts on a 4-year-old Apple object-oriented system research and development project known as Pink.

IBM will integrate portions of the Taligent technology into OS/2 and AIX along the way. The Taligent product will also be designed to be compatible with systems based on OS/2, AIX and the Macintosh, Kuehler said.

Kuehler: *Both companies will continue to 'vigorously compete'*

The ability for one system to run both IBM and Apple machines has excited users. "We'll be asking a lot more of our PCs and our networks, and it would be very, very difficult to achieve this if the two major forces in the industry hadn't gotten together to combine strategies," Christjansen said.

Another joint venture, called Kaleida, will work on building multimedia standards for computers that use video, audio and animation.

A third venture will involve Motorola, Inc. in developing a line of microprocessors based on reduced instruction set computing (RISC) technology. The PowerPC chip design will be used by both Apple and IBM as the basis for their next generation of desktop computers. The chip is scheduled to be introduced in two to three years.

Motorola is expected to take the RISC System/6000's multiprocessor chip set and shrink it into a single chip that could be used to power computers ranging from handheld devices to engineering workstations. The chips will be sold to all comers. Sculley said that eventually, all Macintosh computers will use PowerPC chips.

Another technological arrangement will be the development of a new Unix operating system called Poweropen. Its goal will be to combine the ease of use of the Macintosh with a Unix that has wide appeal. The resulting system will be able to run Macintosh software on either Apple or IBM computers.

Mid-Atlantic Senior Correspondent Johanna Ambrosia contributed to this report.

Execs view the alliance

How will the fruits of the Apple/IBM union affect the industry?

Jim Manzi, president of Lotus Development Corp.
"For too long, we've focused on automating singular tasks and not on how to improve productivity. [The new products] will buffer customers from the complexities of working in a multiple-platform environment."

■

Ron Whittier, vice president of the Software Technology Group at Intel Corp.
"The market will be expanded. It will offer new richness and ease of use on the PC platform."

■

Ray Noorda, president and CEO of Novell, Inc.
"It will inspire other relationships."

■

Philippe Kahn, president of Borland International, Inc.
"Object-oriented is to the software industry what the invention of the microprocessor was to the hardware industry."

Sybase opts for per-user pricing; costs soar for some users

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — Sybase, Inc. rewrote its book on pricing recently. From now on, it will base the license fees for its SQL Server relational database product on the number of people who use it. This per-user pricing affects all Sybase license contracts written after Sept. 15.

Sybase confirmed the change last week. "We've instituted user-based pricing across the board," said Richard Yanowich, vice president of marketing at Sybase. "We contacted all customers through one means or another, initially through a direct-mail piece and a formal customer notification letter." Some users were informed of the change by Sybase sales representatives.

Per-user pricing will affect all sizes of Sybase database servers, whether they work on Sun Microsystems, Inc. workstations, IBM Personal Computers or Digital Equipment Corp. VAX computers. Until now, Sybase had limited its per-user pricing program to low-end systems with one to four users.

There are several pricing tiers, the lowest of which covers the first eight users of a system, Yanowich said.

The Sybase pricing system was created after intensive interviews with 100 customer accounts last year indicated that it would be acceptable, the company said. For now, per-user pricing will be run on an honor system, Yanowich said. "We're assuming that customers are willing to pay for the value they receive," he said. Other software vendors enforce per-user pricing through a software-use monitor that is resident on the database server.

Sybase claimed that prices for many Sybase sites will not change very much under the new per-user pricing policy. However, some Sybase users reported that prices for low-end products, such as the SQL Server for OS/2, have tripled.

Price climb

Bill Sopor, a project manager at Chevron Canada in Vancouver, British Columbia, was told that the $995 price for each SQL Server for OS/2 database engine will climb to more than $3,000 for the first 10 users of each server. Chevron Canada has 35 such servers.

Unlimited use of the Sybase SQL Server for OS/2 jumped to nearly $8,000, Sopor said.

A Sybase official confirmed that the base price for SQL Server for OS/2 had nearly tripled from $995 to $2,995, and the price for an unlimited number of users had doubled from $3,995 to $7,995 for OS/2 machines. However, he explained that the old $995 was for five users and that the higher price now covers 10 users.

News of the change traveled rather unevenly. Some customers said they have not yet been notified. Others learned of it through casual conversations with other users.

Users said only a few of the customers attending a Sept. 11 Sybase user meeting in Boston knew of the pricing change, which took effect four days later.

NEWS SHORTS

Unisys spins off defense unit

Long rumored to be looking for a buyer, Unisys Corp. decided to go public last week with the sale of its defense systems group and announced plans for an initial public offering. Unisys hopes to raise $832 million through the sale, with an undisclosed portion of the proceeds going to reduce Unisys' crushing debt load of $3.8 billion. The 17,000-person defense division will be called Paramax, Inc. and will be headed by Frederick F. Jenny, the current president of the McLean, Va.-based division.

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CSC buys network group

Computer Sciences Corp. last week completed the purchase of Intelicom Solutions Corp., a Bethesda, Md., supplier of systems for the telecommunications industry. The privately held Intelicom, formerly Telic Corp., has an annual revenue of about $50 million.

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Adobe brings out font processor

Adobe Systems, Inc. ventured into the hardware arena with the announcement of the Adobe Type 1 Coprocessor, a font-rendering chip that should help eliminate the bottleneck caused by software-generated character creation. The coprocessor is capable of rendering text at up to 2,000 char./sec. Adobe called the chip "a very fast, hardware-based version of Adobe Type Manager software."

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Knowledgeware sees problems

Knowledgeware, Inc. dropped a bomb last week, announcing that results for its first quarter, which ended Sept. 30, will be "substantially" below expectations and could likely cause a net loss. The news comes shortly after an executive reorganization brought about by the resignation of Terry McGowan, president and chief operating officer, and Donald Ellis, senior vice president of finance and administration.

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Wang releases Upword

Wang Laboratories, Inc. last week officially unwrapped Upword 2.0, its document processor for the Microsoft Corp. Windows 3.0 environment [CW, Sept. 23]. The package integrates Windows and non-Windows applications and is targeted toward the work-group computing and image management environment. Priced at $495, the software is scheduled to ship later this month.

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CA dropped from board suit

Computer Associates International, Inc. last week was dismissed as a co-defendant in IBM Credit Corp.'s suit over use of subleased computer equipment. IBM had brought the original suit against lessor Comdisco, Inc. earlier this year and then amended the complaint in August to bring in CA as a Comdisco client. CA said late Friday that it was dismissed from the case by "agreement."

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AT&T on fast-packet bandwagon

AT&T spoke out last week about frame relay on the customer premises equipment side with its announcement of the BNS-1000 Fast Packet Switch, reported to handle up to 15,000 simultaneous two-way connections. The router component to the fast-packet family will be supplied by Wellfleet Communications, Inc. per a reseller agreement announced last week between the two companies.

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Floating Point in trouble

Public trading of stock in Floating Point Systems, Inc. (FPS) was suspended last week after the Beaverton, Ore., company said it has failed to get financing necessary to preserve any value for existing shareholders. FPS will seek other financing alternatives to ensure the continued manufacture, sale and service of its current and future products, a company spokesman said.

Users get jump on Oracle 7.0

Vendor gives aid to those tweaking 6.0 while awaiting database upgrade

BY JEAN S. BOZMAN
CW STAFF

MIAMI BEACH — Despite expectations of an announcement last week, users of the Oracle Corp. relational database may have to wait until mid-1992 to get Version 7.0, which supports distributed databases. But some users, with guidance from Oracle software engineers, are already coding applications that will use Version 7.0's features.

At the International Oracle Users Group (IOUG) meeting here, Oracle told users that selected sites had recently begun to use Version 7.0 in beta-test and quality-assurance programs.

Version 7.0, which will replace Version 6.0, has several key features to aid distributed database processing, including two-phase commit, distributed query management and "triggers" that speed transaction processing in the database server.

Some users said they have already started to program database triggers using their current Oracle 6.0 servers. Triggers automatically launch cause-and-effect updates to database tables. For example, they would delete items from a company's inventory database in Chicago when those items are ordered by customers in New York.

"With Version 7.0, you can turn on the business rules you wrote into your Version 6.0 applications," said Jim Raper, president of the Southeast chapter of the IOUG, in his explanation of how Version 7.0 would automate updates that are essentially manual and much slower now.

Oracle's Ellison *says the unannounced Version 7.0 will help assuage competitive pressures*

Industry analysts said the introduction of Version 7.0 had been pushed back from the summer of 1991 to make Version 7.0 more competitive with database products from Sybase, Inc. and Ask Computer Systems, Inc.'s Ingres Corp. The Sybase and Ingres databases already have two-phase commit, triggers and referential integrity.

"Version 7.0 plugs all the gaps we had in Version 6.0," said Oracle Chief Executive Officer Lawrence Ellison, and Version 7.0 "will run about 25% faster than Version 6.0." He added that Version 7.1 would include support for complex data objects.

Oracle also announced SQL*Net 2.0, a rewrite of the SQL*Net networking software that links Oracle databases even if they are on different hardware platforms [CW, Aug. 12].

SQL*Net 2.0 is scheduled to ship by year's end for a variety of Unix, IBM, Digital Equipment Corp. and Hewlett-Packard Co. machines.

Oracle retreats from Nippon's millions

BY JEAN S. BOZMAN
CW STAFF

MIAMI BEACH — Oracle Corp. last week took another step back from its June agreement in principle to gain $200 million in financing from Nippon Steel Corp. in Tokyo in exchange for a 49% share of the Oracle Japan subsidiary [CW, June 10].

At the same time, Oracle said it had received a one-year, $100 million credit line from a syndicate of eight banks.

The new loan came just as Oracle's 30-day extension on another bank syndicate's $100 million line of credit expired [CW, Sept. 9].

However, Oracle Chief Executive Officer Lawrence Ellison left the door open for continued negotiations with $19.3 billion Nippon Steel, which could yield a marketing partnership in Japan and a reduced amount of financing.

"The courtship's been going on for a while. We either need to get married or to get divorced," Ellison told industry analysts here last week. "In six weeks, we should either have a conclusive deal or decide to go our separate ways."

In early September, Oracle indicated that negotiations with Nippon Steel had bogged down because of Oracle's concerns that the Japanese firm's systems integration unit would build proprietary manufacturing applications on the Oracle relational database engine.

Oracle's proprietary manufacturing applications went into general release last week.

Industry analysts were pleased with Oracle's rejection of the original Nippon Steel deal, saying it signaled Oracle's return to financial stability one year after a dramatic $29 million loss.

"The average user doesn't seem to be very concerned about the Nippon Steel deal," said David Kreines, a database manager at the Educational Testing Service in Princeton, N.J., and chairman of the International Oracle Users Group conference.

"They probably feel somewhat reassured by the fact that Oracle had a profitable quarter and that Oracle's stock went up," Kreines added.

Compaq color portable due

The onslaught of new moves in the portables market is under way, with IBM and Compaq Computer Corp. leading the pack.

Compaq plans to introduce today its Portable 486C, a 17.6-pound, AC-powered portable with an IBM Video Graphics Array-compatible color screen.

Last week, IBM cut prices on its Personal System/2 L40SX laptop by 23%, from $5,245 to $3,995.

Compaq's Portable 486C sits on the Extended Industry Standard Architecture bus, uses an Intel Corp. 33-MHz I486DX chip with 4M bytes of random-access memory (expandable to 32M bytes) and has extensive built-in security features, including what Compaq calls its Drivelock security facility. Users can set it so their hard drives can be accessed only with a password. The Portable 486C retails for $9,999 with a 120M-byte hard drive. Compaq expects to ship in the mid- to late fourth quarter.

Most analysts said they liked what they saw in the Portable 486C. "It's an exceptional product," said Tim Bajarin, executive vice president at Creative Strategies Research International, Inc. "I would say it's the first portable environment I would consider putting on my desk to kick out my desktop."

Timeplex moves beyond 'T1 vendor' image

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — On the heels of being sold by Unisys Corp. to a $2 billion Swiss telecommunications firm, Timeplex, Inc. last week made strides in its year-old mission to revamp its image from T1 vendor to enterprise network supplier. The firm made sweeping product and service announcements that should nurture its existing worldwide customer base, analysts said.

In a briefing here, the company described enhancements to its product line, which include international network design, integration and management outsourcing services that are available immediately. On the product side, Timeplex added such offerings as a Simple Network Management Protocol-based local-area network and wide-area network management system and frame-relay products in the local and wide area (see chart).

The first signs of customers buying into Timeplex's revised role have recently surfaced. For example, Timeplex said it has inked an 800-router deal with Nationwide Anglica, a UK-based bank. Timeplex will officially announce the deal this week.

However, while Timeplex executives said they were 51 sites into a 600-router installation at an existing customer site, Great Western Financial Corp. in Northridge, Calif., said the contract is not a done deal, according to Chuck Matthews, Great Western's vice president of communications services. "While we're running some extensive pilots with Timeplex equipment, we're nowhere near 51 installations."

> A RECENT router deal with UK-based Nationwide Anglica was one of the first signs of customers buying into Timeplex's revised role.

Jack Sadler, group manager of technical services at Lucky Stores, Inc., a Timeplex shop in Dublin, Calif., said he is choosing from among Timeplex, Newbridge Networks, Inc. and Network Equipment Technologies, Inc. this week for a corporatewide network revamp. He said he has not evaluated LAN vendors because with the three finalists, "we get more of a total solution."

Also last week, Timeplex voiced its goal to expand its product family to include standards-based cell-relay systems that are interoperable with its installed T1 multiplexer base.

"It's important to us to be able to grow our architecture over the next few years without having to totally replace the equipment," said Jess Reed, assistant vice president of telecommunications at insurance firm Geico Corp., a Timeplex user in Washington, D.C.

Timeplex executives also discussed the firm's new ownership, which shifted in the 11th hour from a joint Swiss/South African venture to a 100% purchase by Bern-based Ascom Holding AG. The $207 million sale was consummated Sept. 27.

"It's a real positive development that Ascom is the only owner," said Rick Malone, a principal at Vertical Systems Group, Inc., a consultancy in Dedham, Mass. "First, you're more nimble in getting decisions made with only one parent. Second, the South African involvement had a political stigma to it," he said.

According to the Oct. 4 issue of the *Johannesberg Star*, Swiss Bank Corp. revised financing at the last minute for Datakor/Mercedes Information Technologies, Inc., which was to be a 49% joint owner with Ascom. The move, according to the *Star*'s report of Datakor statements to its shareholders, gave the South African firm insufficient time to resubmit its foreign exchange applications.

Evolving with the times

No longer in the shadow of a financially ailing parent, Timeplex looks to outsourcing services and the enterprise network

	Added 1990-1991	1992 . . .
LAN equipment	• Bridge/router • FDDI concentrator	• Frame relay on bridge/router (Q1 1992) • SMDS, T3 interfaces on bridge/router (1992)
WAN equipment	• T1/T3 hub • ISDN gateway and T1 access systems	• Frame-relay switch (Q1 1992) • Standard cell-relay switch (future)
Network management	• IBM Netview/PC and AT&T Accumaster links • SNMP-based LAN manager (Q4 1991)	• SNMP-based integrated LAN/WAN manager (Q1 1992) • OSI compliance (future)
Network services	• Outsourced network management, design and integration	

Source: Timeplex, Inc. CW Chart: Janell Genovese

ACE shows progress but user skepticism remains

BY MARYFRAN JOHNSON
and J. A. SAVAGE
CW STAFF

In the six months since a handful of vendors — led by Digital Equipment Corp., Microsoft Corp. and Compaq Computer Corp. — raised the curtain on their Advanced Computing Environment (ACE) alliance, most of the show to develop a new desktop computing standard has been hidden behind that big curtain.

Yet in a very public display of progress last week, Microsoft and The Santa Cruz Operation (SCO) previewed the two operating systems that will run on ACE hardware when it begins to surface in 1992.

The loosely knit organization of hardware and software vendors has also shown a surprisingly steep growth path. From 21 initial members — including DEC, SCO, Compaq, Microsoft and Mips Computer Systems, Inc. — the alliance now includes 181 vendors. Industry watchers are cautiously optimistic about ACE's chance of tempting enough users to grab significant market share on the desktop.

"ACE is real, but it won't have substance until we see more third parties — both 386 clone companies and key application software vendors — jump in," cautioned Jeffry Canin, an analyst at Montgomery Securities in San Francisco.

By mid-1992, ACE members said, users will find Microsoft's New Technology (NT) operating system running thousands of MS-DOS applications across Intel Corp.-based hardware and reduced instruction set computing (RISC) machines based on Mips' R4000 chip.

About that same time next year, SCO officials said, they will be marketing a new version of the Open Desktop (ODT) operating system for Mips platforms as well as for Intel machines. ODT runs only on Intel now, but when it moves to the RISC platform, all its current applications can be recompiled to run there. DEC said its 4,200 Ultrix applications also will run under ODT.

"If half of that is true, it's still fantastic," said Ken Krallman, MIS director at Carleton Technologies, Inc., an aerospace manufacturer in Orchard Park, N.Y. "The idea of pulling PC software to a Unix platform without some kludgy piece of software in place would be excellent news."

"I think ACE illustrates an industry trend that big vendors finally recognize operating systems and hardware are a commodity," said Robert Forster, supervisor of DEC systems for the information management department at Sikorsky Aircraft in Stratford, Conn.

Skeptics in the crowd

Not all users are confident ACE will deliver on its promises.

"I am a strategic customer of DEC's, and I don't have a clue what's going on," said Mohamed Ellozy, director of scientific computing in the biostatistics division at the Dana Farber Cancer Institute in Boston.

As DEC merges its Ultrix operating system into this future version of ODT, Ellozy said, he is concerned about a rocky ride on that migration path. "I have things break just moving from Ultrix 4.0 to 4.1," he said. "So I'm not going to believe that everything will go so smoothly in this next move."

That kind of skepticism is understandable because the major players in the consortium hold differing views of how users will put ACE-related software and hardware to work.

Once ACE becomes a reality, customers with Intel-based personal computers and Mips-based workstations are supposed to be able to run applications across platforms without recompiling, as long as they stick with operating systems from one vendor.

Applications that run under Windows NT, for example, will run on PCs and Mips-based systems as long as users have installed DOS, NT for Intel and NT for Mips operating systems. Applications that run on SCO's operating system will not automatically run under NT.

While ACE shapes up to deal its hand, users should also stay alert for vendor hype.

DEC and Silicon Graphics, Inc., for example, claim they already have "ACE-compatible" hardware to sell. Yet ACE compatibility means next to nothing, said James Billmaier, vice president of software marketing at Mips. The key term is "ARC-compliant," referring to products that meet the Advanced RISC Computing (ARC) specifications from ACE.

The ARC specifications, for example, require hardware to have certain audio abilities, an Ethernet connection and other requirements. "You cannot obtain ARC compliancy until the hardware runs the operating system" in mid-1992, Billmaier noted.

Last week, Mips previewed the R4000 chip running in a prototype ACE machine. While the chip will initially run at 50 MHz, scaling up to 100 MHz, its potential benchmark ratings are not as high as what Hewlett-Packard Co. provides today.

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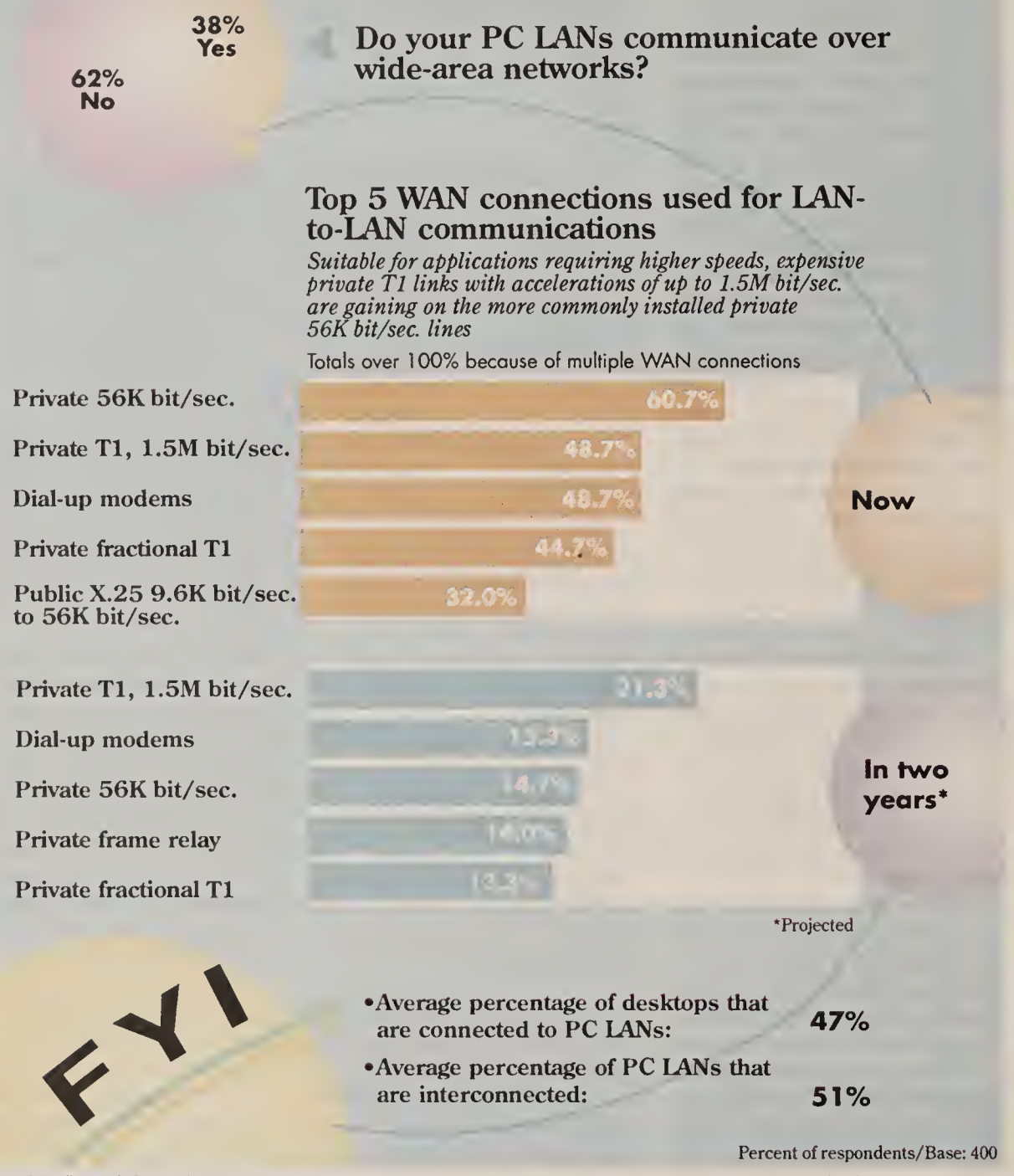
TRENDS

Wide-area networks

As the percentage of interconnected PC LANs continues to grow, so does the desire to link to widely dispersed networks



Source: Business Research Group, Newton, Mass.

CW Chart: Janell Genovese

INSIDE LINES

Look here: Systempros

▶ Compaq will counter IBM's hot-selling PS/2 Model 95 with an upgradable, low-end Systempro based on the 33-MHz Intel I486 chip. Also announced at Networld next Monday will be two other members of the Systempro LT family, one based on the 25-MHz 80386 and one based on the 25-MHz 486SX. Observers say these Systempros will serve as the basis for follow-on, higher end Systempro products based on Intel's P24 dual-speed processors. Look for that announcement in November. Meanwhile, several corporate and government users say that for the first time, Compaq's products cost less than AST's, and in some cases, they undercut Dell's as well.

Printers getting DECed

▶ Some DEC customers with the latest Apple Macintoshes in their shops are running into annoying printer foul-ups between DEC's Pathworks for Mac networking software and Apple's System 7.0 Macintosh operating system. One West Coast user, whose printer refuses to work with System 7.0 drivers, said, "It's like dealing with printer wars." A DEC spokeswoman said the 7.0 version of Pathworks for Mac has been delayed because DEC is bundling more features into it. The company said it sent out "mandatory updates" suggesting several fixes customers might try, telling those with recurring trouble to call their local sales representative for help.

Helps to have friends

▶ Thirty-two vendors will support Novell today in the announcement of a proposed Hub Management Interface standard. Chip vendors National Semiconductor, Advanced Micro Devices and others have reportedly taken what used to be a multiport repeater (Ethernet wiring hub) on an 8½- by 11-in. card and shrunk it down to a 1-in. chip. The adapter card vendors and hub vendors will build "Hubcards" to be inserted into Novell Netware servers for a wiring hub right inside the server serving two to eight ports.

What's two years among friends?

▶ Two years ago, Oracle launched its manufacturing applications package with a glitzy laser light show and dinner for thousands at a user meeting. Finally last week, Oracle said the product was ready for shipment to customers. The applications, which get their data from an Oracle relational database, are intended to complement Oracle financial applications now in use at 300 sites worldwide.

Gettin' mighty cozy

▶ IBM and British Telecom (which now prefers to be known as "BT," since it really isn't just a British carrier anymore) seem to be laying all the groundwork for a serious joint international networking venture. First we heard about negotiations for BT's Syncordia company to manage a piece of IBM's Information Network in Europe; then BT chose IBM to supply NET switches for Syncordia's backbone. And next week, the two companies are expected to announce interconnection of their network management platforms.

Novell packets in overdrive?

▶ The U.S. Department of the Census is reportedly testing a software tweak to Novell's Netware LAN software dubbed "Burstmode," designed to rev up the transmission of Novell IPX packets across Netware networks. The software, said to be Novell-generated code for Netware servers and clients, reportedly allows several packets to travel together instead of in single file. Novell is mum on the subject, but the Census Department said it expects the software — which would challenge multiprotocol router vendors' IPX routing throughput — to be in production within 60 days.

The U.S. comptroller of the currency is warning banks not to allow customers to use the last four digits of their Social Security numbers as passwords for ATMs. They show up in too many places, the comptroller says, and therefore invite fraud. Maybe the best suggestion is to use the password our congressmen use at the congressional bank — "Bouncy-bouncy." If you'd like to make a hot news deposit, call our brand-new News Editor, Alan Alper, at (800) 343-6474, fax him at (508) 875-8931 or Compuserv the lad at 76537,2413.

NEXT WEEK

Despite recent publicity about E-mail monitoring, the subject of IS ethics remains largely the province of academicians and consultants. IS professionals such as **Alana Shoars** who are willing to risk their jobs by raising ethical questions are still rare. Industry observers say IS needs to think about the important issues. See Executive Report. ▶

Alan Levenson

No longer is it true that a single monolithic computer is the most cost-effective option for a company. A group of AS/400s can provide performance comparable to that of a larger minicomputer (or even a mainframe) at lower cost. Just as importantly, using AS/400s can offer firms the benefits of distributed processing. See In Depth.

A few months ago, some guys came by and stuck this on our windows.

PC MAGAZINE

EDITORS' CHOICE

And they weren't just any guys, either.

They were a group of editors from *PC Magazine*, and in their February 26th, 1991 issue, they had some awfully nice things to say about IRMA™ WorkStation for Windows.

Best Windows 3.0 3270 Terminal Emulator: IRMA WorkStation for Windows v. 1.0. Feb. 26, 1991.

Some comments:

"DCA®'s product is by far the most flexible that we've tested."

"Its flexibility, powerful scripting language, interface, and asynchronous abilities make it a top choice."

And, finally, "It's nice to see IRMA...out there again as the leader of the pack."

What did we do to deserve such plaudits?

In the Windows™ 3.0 operating environment, only IRMA WorkStation for Windows gives you a choice of single (CUT) or multiple (DFT) sessions via coaxial cable, remote SDLC or token-ring connections, as well as asynchronous connections.

Mainframe applications are easier to use because of our QuickHit™ and QuickPad™ features.

You also get 3270 terminal, 3270 printer and asynchronous terminal emulations, and an extensive range of 3270 and asynchronous file transfer protocols, including DCA's and IBM®'s.

Because both DCA and IBM hardware are supported, you can take full advantage of IRMA WorkStation for Windows today.

In addition to its tremendous flexibility, IRMA WorkStation for Windows is very simple to use.

For instance, mainframe data can be directly embedded into a word processor or spreadsheet by using DCA's QuickScript™ and Windows Dynamic Data Exchange (DDE).

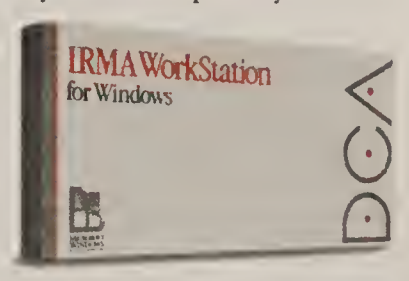
Only IRMA WorkStation for Windows supports APPC and supplies you with a graphical user interface that conforms to IBM's SAA/CUA standard, and gives you a transparent migration path to OS/2®, using DCA/Microsoft® Select™ Communications Workstation.

For a free demo disk call 1-800-348-DCA-1, extension 78Z.

In order to experience the most feature-rich 3270 connectivity solution, just call, 1-800-348-DCA-1, ext. 78E and we'll have a free demo disk to you in no time.

And after checking out the capabilities that made IRMA WorkStation for Windows the *PC Magazine* Editors' Choice, we think you'll be pretty stuck on our windows yourself.

DCA



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UNIX DATABASE

Which UNIX® RDBMS did Hewlett-Packard®, IBM®, Unisys®, Data General®, AT&T®, Sun®, and Sequent® choose to demonstrate the power of their latest UNIX Systems?

Informix.

IDC Study on UNIX OLTP

UNIX On-Line Transaction Processing at Multi-User UNIX Sites (January 1991) states that some 47.4% of sites running commercial applications on multi-user UNIX systems are running OLTP. The study reports that Informix is in use at more sites than any other DBMS for UNIX OLTP applications.

About the TPC

The Transaction Processing Performance Council (TPC) was founded in 1988 to define transaction processing benchmarks and to provide performance data to the industry. Today, 40 hardware and software vendors, including AT&T, Bull, Sybase, Data General, DEC, ASK/Ingres, Fujitsu, IBM, Informix, Hewlett-Packard, NCR, Olivetti, Oracle, Pyramid, Sequent, Siemens, Sun, and Unisys are members.

Within the past five months, *every one* of these companies selected and used the INFORMIX-OnLine database server to demonstrate to their customers the power of their latest UNIX systems. No other UNIX database product has been this extensively benchmarked—because nothing shows performance like OnLine.

New TPC Benchmarks Used

In each case, the Transaction Processing Performance Council's rigorous TPC A and TPC B benchmarks—the new standard for comparing system and database performance—were used to highlight OLTP performance and database throughput.

The Number 1 Choice for UNIX OLTP

Informix is the number one UNIX OLTP choice. A January 1991 International Data Corporation (IDC) study shows that when it comes to UNIX OLTP applications, Informix products are installed at *more than twice as many multi-user UNIX sites* as our closest competitor. It's independent confirmation that thousands of companies worldwide rely on Informix-based OLTP solutions every day.

A Decade of Innovation

Informix has been a UNIX RDBMS technology leader for over 10 years. Continuous innovation has resulted in advanced application development languages, distributed client/server computing, gateways to other computing environments, and multimedia flexibility you can take advantage of today.

Find Out More

We'd like to send you benchmark specifics—and information about how Informix products can meet your data management needs.
Call us toll free: **1-800-688-IFMX, ext.2.**

INFORMIX-OnLine Database Server

OnLine was built for speed...and that's what it delivers. Developed entirely on UNIX, the OnLine server turns in optimum performance on every popular UNIX architecture—including symmetric multiprocessors, RISC, and CISC.

TP1 vs. TPC Benchmarks

The TP1 benchmark is no longer the accepted benchmark for measuring database performance. The new TPC tests establish more complete, thorough specifications than TP1, leading to more objective, verifiable results for comparing performance between hardware systems and software products. TPC Benchmark™ A measures OLTP processing performance. TPC Benchmark™ B—similiar to a batch test—focuses on database throughput.

INFORMIX®

Data management for open systems.

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